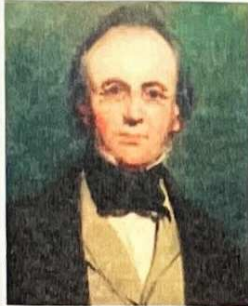


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Some of the 36 masonry arches of the eastern section of the **Almond Valley Viaduct**, constructed as part of the **Edinburgh & Glasgow Railway** and completed in 1841.

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John Miller

born 26th July 1805, Ayr, Scotland, UK
died 8th May 1883, 2 Melville Crescent, Edinburgh, UK
buried Dean Cemetery, Dean Path, Edinburgh, UK
era Georgian

Written by **Eleanor Knowles**, edited by **Jane Joyce**
in association with **Professor Roland Paxton**

Scottish railway engineer John Miller built more railways in Scotland in the course of his working life than any other engineer, and he still managed to retire at the age of 45. His career flourished in the second quarter of the 19th century — the years of the 'Railway Age' and 'Railway Mania'.

By the end of 1843, Miller had engineered 40% of Scotland's 442km of track. In November 1845 he submitted proposals to Parliament for a further 2,400km, and by the end of 1866, a total of 3,610km had been completed. He recognised the importance of rail for commerce, stating that "a manufacturing population go[es] about much more than an agricultural population ...".

Perhaps Miller's greatest achievement was the 72km **Edinburgh & Glasgow Railway** of 1842. Planning and surveying began when he was only 20 and already working with his mentor and future partner, Thomas Grainger. He became the project's engineer in 1838, responsible for the line and its many bridges, three tunnels and seven viaducts, including the **Almond Valley Viaduct**.

He knew railway pioneers George (1781-1848) and son **Robert Stephenson** (1803-59), and admired and respected their work. He followed their lead in trying to minimise gradients along the maximum length of rail tracks. He built well-engineered lines and beautiful masonry structures that have stood the test of time.

Miller was a self-made man with a lifelong interest in continuing education and self-improvement. He wasn't shy about offering his opinion. However, he doted on his family and worked diligently to secure their prosperity. He invested in the railways he worked on, often becoming a shareholder — a shrewd move that helped him amass a fortune. He then spent more than three decades in busy retirement, devoting much of his time and money to the Free Church of Scotland, as well as serving as a Member of Parliament for Edinburgh.

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Early years and family life

John Miller's family came from the Ayrshire coast on the Firth of Clyde in south west Scotland. His father, James Miller (1760-1849), began his working life as a 'wright' — a carpenter or joiner — in the village of West Kilbride in the north of the county. James later moved south to Ayr, the county town and its largest settlement, famous as the location of the first Scottish Parliament (April 1315). Scotland's celebrated poet Robert Burns (1759-96) was born 3km to the south in Alloway.

James Miller worked hard and soon became a noted builder. He was the contractor for Ayr's Academy, Barracks and Assembly Rooms. He was also a Convener of Ayr, which indicates that he played a leading role in the town's municipal life.

At some point, James met and married Margaret Caldwell. All their children were born in Ayr — they had at least 10, born between 1788 and 1807, though only eight survived into adulthood. John was the penultimate of these, born on 26th July 1805. He had three older brothers (Hugh, James and Robert), three older sisters (Mary, Margaret and Hannah) and a younger brother Thomas.

Miller's father rented, then purchased (1821), a works yard in the town's High Street. This was one of a series of acquisitions on the High Street and elsewhere in Ayr. In 1821, he also bought Springvale House, a Georgian residence with 0.6ha of land. With enlarged grounds, this became the family home. The practice of investing in property was one John Miller would follow enthusiastically in later years.

The family was secure financially and aware of its civic duties. John's brother Hugh (1792-1858) served as Provost of Ayr 1841-55, and Miller Road (originally Miller Place) is named after him. The provost was usually the chief magistrate or convener of a Scottish burgh council. South Ayrshire had five burghs (Ayr, Troon, Girvan, Maybole and Prestwick) and so five provosts. The role is unique to Scotland and is akin to that of a mayor elsewhere in Britain.

John Miller attended Ayr Academy until at least 1817, when he was 12 years old. The school had been founded c.1233 but only called Ayr Academy after 1796, and later moved from Sandgate to Fort Street.

There are two versions of Miller's first employment after leaving school — both relate to the legal profession. He may have begun working at twelve and a half years of age in the office of solicitor Charles Dalrymple Gairdner (1794-1867), who later became a banking agent. Or he may have been apprenticed to Alexander Murdoch (1777-1843), the town clerk of Ayr. It's also possible he did both.

In 1823, aged 18, Miller left Ayr to travel eastwards to Edinburgh. There he was employed by Thomas Grainger (1794-1852), who had established himself as an independent civil engineer and land surveyor in 1816. This was the very earliest days of the railways in the UK, but Grainger was quick to see their potential and much of his work concerned them.

It is also likely that Miller enrolled at Edinburgh University, perhaps influenced by Grainger who had studied there a decade earlier. He could have studied part-time while working, and may have taken law in 1823 and 1824. Records show that in 1826 two John Millers matriculated in arts, which then included engineering.

His prowess in either scholarly or practical work (or both) was sufficient for Grainger to offer him a full partnership in the business in 1825. Miller was just 20 years old, and this remarkable achievement was just the beginning of a fruitful career.

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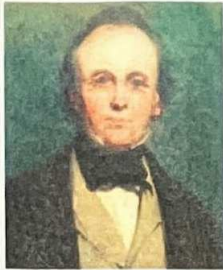
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The coming of the railways

Railways were not entirely unknown in the first quarter of the 19th century. Horse-drawn wagons travelling on timber rails — later iron rails — were widely used for local freight transport, such as moving coal from mines to distribution points, which was the practice in Britain from the 17th century onwards.

A sudden increase in railway building was prompted by a realisation that steam locomotives were superior to horse traction. In 1804, Richard Trevithick (1771-1833) was the first to demonstrate the potential of steam locomotives, and George Stephenson (1781-1848) began building locomotive engines in 1814. Engineers, landowners and manufacturers saw the possibilities and envisaged a countrywide rail network, opening up trade centres and creating demand for services and goods.

John Miller became a joint partner in Thomas Grainger's engineering and surveying firm in 1825, when he was only 20 years old, though he had worked with Grainger for up to two years before that. They embarked together with considerable enthusiasm on a journey into the new world of railways and its feverish pace of construction, working from offices in Castle Street, Edinburgh.

The first project they worked on together was the **Monkland & Kirkintilloch Railway** in Lanarkshire, which was their debut in railway engineering. Grainger obtained a private Act of Parliament for its construction on 17th May 1824. The 16.1km long, 4ft 6in (1.37m) gauge railway began as a horse-drawn line. Steam locomotives were introduced later — the first to be built in Scotland. The line ran from the ironworks at Monkland north west to Kirkintilloch on the **Forth & Clyde Canal**, with short branches to Kipps and Dundyvan totalling 1.2km. It opened on 1st October 1826.

The line's construction and operation were compared unfavourably with those built later. However, it was one of the first schemes learning what was to be a steep learning curve for all early railway engineers. While it was under construction, Grainger and Miller were hard at work on the surveys and designs for the **Ballochney Railway** and the **Garnkirk & Glasgow Railway**. The Parliamentary Bills for these 4ft 6in (1.37m) gauge Lanarkshire railways received royal assent in May 1826 — Ballochney on the 19th and Garnkirk & Glasgow on the 26th.

The 8km long Ballochney Railway ran north east from the Monkland & Kirkintilloch Railway at Kipps, via Ballochney to Arbuckle. It had branches to Airdrie, New Monkland, Clerkston, Stanrig, Whiterig and Blackrig, and it began operating on 8th August 1828. The Garnkirk & Glasgow Railway is the first for which Miller is described equally with Grainger as engineer. The line was 13.2km long and joined the Monkland & Kirkintilloch Railway near the ironworks at Gartsherrie, running west via Garnkirk to St Rollox in north Glasgow. It was designed for steam locomotives.

In January 1831, Grainger and Miller stated their opinion of steam power as: "The decided superiority which Railways, combined with Locomotive Engines, possess over every other communication, seems to be admitted by every unprejudiced man who has paid the least attention to the subject".

The Garnkirk & Glasgow Railway opened in May 1831 for goods transport and was fully operational on 27th September 1831. At the opening ceremony two locomotives travelled the line. Grainger rode on the *St Rollox*. Miller on the *George Stephenson*, whose namesake had provided planning advice and drove the locomotive himself. Both engines were built by **Robert Stephenson** at the **Newcastle upon Tyne works**.

As before, other railway projects were being developed while the Garnkirk & Glasgow Railway was under construction. The two engineers worked on the **Wishaw & Coltness Railway** and the **Polloc & Govan Railway**.

An Act of Parliament authorised the **Wishaw & Coltness Railway** in Lanarkshire on 21st June 1829. It too had a 1.37m gauge and joined with the Monkland & Kirkintilloch, at Coatbridge, passing south of Jerviston and Wishaw to end at Chapel. Part of the line opened in 1833, with the route to Jerviston open on 21st March 1834 and a new branch to Cleland completed in 1841. The lengthy project concluded when the whole 17.75km became operational on 9th March 1844.

The **Polloc & Govan Railway** bill received royal assent on 29th May 1830. This railway covered just 1.9km in the city of Glasgow and opened in August 1840.

Meanwhile, Miller married Isabella Ogilvie (1799-1876) on 1st December 1834. He was 29 years old and Isabella was five years older. Her parents were Perth merchant Duncan Ogilvie and Janet Thomas, who had married in May 1797 and raised three sons and three daughters. Isabella was their second child and eldest daughter.

Miller's reputation was growing, and ultimately it would eclipse Grainger's. The opening of the Garnkirk & Glasgow Railway marked a change in their working relationship and they pursued more separate projects within the partnership. The

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worked together on only one more railway initiated after 1835 — the 4.8km long **Paisley & Renfrew Railway**, another 1.37m gauge line, linking Paisley and Renfrew. It was authorised on 21st July 1835 and opened on 3rd April 1837.

Miller and Grainger also collaborated on a proposal for a line from Brechin to Montrose in Angus on the east coast, which had been surveyed initially by fellow Scottish engineer **Robert Stevenson** (1772-1850) in the 1820s. The scheme came to nothing and in 1837 they were still waiting to be paid.

By 1835, Miller and his wife were living at 50 Northumberland Street in Edinburgh, and it was here that their first child, Margaret, was born on 20th September 1835. The family moved to 23 Rutland Street in the city before their second child arrived — Isabella was born on 20th April 1838. The couple would produce three more children: their only son John (23rd December 1840), Jessie born on Miller's 37th birthday (26th July 1842) and Mary (21st March 1844).

From 1835 onwards, Miller poured his engineering expertise into a huge number of railway schemes, as well as surveying and civil engineering work. Grainger pursued railway projects of his own. In 1845 they would decide to dissolve the partnership, and Grainger was to die as a result of a railway accident just seven years later.

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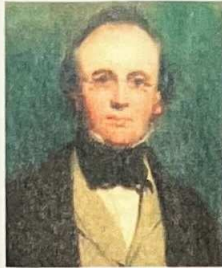
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Extract from the *Glasgow & Ayr Railway Guide of 1841* ...

"Under the vigilant personal superintendence of Mr. Miller, Engineer — whose professional ability, and devoted interest in this undertaking, have frequently in public been warmly applauded by the Directors — the works progressed very rapidly. A clause in the Act required that the operations should commence at the Ayr end of the line, which was of comparatively easy formation, so that the heaviest part of the work was not begun till September 1839. As giving an idea of the energy as well of the Engineer as Contractors, it is worthy of mention that on the Elderslie cut, between Paisley and Johnstone — the key to the opening of the entire line — 1,400 men were employed on a portion less than half a mile in length ... the entire line was opened in twenty-six months from the time the foundation stone of the first bridge was laid."

Lithograph: Glasgow & Ayr Railway Guide, 1841



One of the world's largest masonry arches — **Ballochmyle Viaduct**
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The Edinburgh & Glasgow Railway

After 1831, Miller began to undertake railway schemes as a solo engineer, though he remained in partnership with Thomas Grainger until 1845. Both were much in demand during the first half of the 19th century — especially Miller — setting up what would be the basis of the modern Scottish rail network.

Both believed that a wide gauge railway was better for transporting large loads at speed. A wider gauge meant larger wheels, which reduced friction on straight tracks, increasing efficiency (less coal used per unit weight). The greater width allowed goods to be carried between the wheels rather than over them, resulting in rolling stock with lower centres of gravity and better stability.

They favoured a gauge of 5ft 6in (1.68m), measured between the inside edges of the running rails. Though this gauge was later abandoned in Scotland, it was adopted in India at the behest of fellow Scotsman James Andrew Broun-Ramsay (1812-60), Governor-General of India 1848-56. Fellow engineer **Isambard Kingdom Brunel** (1806-59) thought 5ft 6in not wide enough and championed a 7ft 1/2in (2.14m) gauge. Most UK railways at the time had a 4ft 8 1/2in (1.435m) gauge, a measurement that derives from the re-use of existing colliery paths as rail routes.

gauge

Miller's first independent venture was the **Dundee & Arbroath Railway** along the east coast of Scotland, which had a 5ft 6in gauge. He was appointed engineer to the railway company in 1835, at a time when the economic uncertainties of the previous decade were being overtaken by rapid industrial growth. The new prosperity of the Victorian era was about to begin.

The enabling Act of Parliament was passed on 19th May 1836, with the help of the company's major investor and landowner William Ramsay (1771-1852), first Baron Panmure. The 27km route cost £153,100 to build and opened on 6th October 1838, a few months after Queen Victoria's coronation. At Arbroath, it joined Grainger's similarly-gauged **Arbroath & Forfar Railway** (completed 1839). In 1845, a Royal Commission chose 4ft 8 1/2in as Britain's 'standard gauge' and both Scottish railways were brought into line — Arbroath & Forfar in 1846, and Dundee & Arbroath in 1847.

Miller wasn't a man to work on just one railway if he could be working on several at the same time. Between 1837 and 1850, when he retired, he worked on at least eight railways and numerous associated structures — including perhaps his greatest achievement, the **Edinburgh & Glasgow Railway**.

He was engineer to the **Glasgow, Paisley, Kilmarnock & Ayr Railway**, the Act for which received Royal Assent on 15th July 1837. From Glasgow its route was westwards to Paisley, then south west to Dalry and Kilwinning, where it divided, going west to Ardrossan and south to Ayr. At the opening on 11th August 1840, a 21-carriage train carrying 350 people made the journey from Glasgow to Ayr pulled by two locomotives, one of which was the *Bruce* designed by Miller himself.

The line from Glasgow to Paisley was shared with the **Glasgow, Paisley & Greenock Railway**, which was engineered by Joseph Locke (1805-60) and John Edward Errington (1806-62). The joint portion opened on 15th July 1840 and the line to Greenock was completed in March 1841.

A branch of the Glasgow, Paisley, Kilmarnock & Ayr line, from Dalry to Kilmarnock, opened on 4th April 1843, completing 88.5km of railway. This was extended in 1846-9 to Cumnock and includes Miller's spectacular **Ballochmyle Viaduct**, then the world's largest masonry arch.

Concurrently, Miller directed the upgrade (1846-7) of the **Kilmarnock & Troon Railway**, which became part of the Glasgow, Paisley, Kilmarnock & Ayr. The Kilmarnock & Troon is Scotland's earliest public railway, designed by William Jessop (1745-1814) and constructed 1808-11. It includes probably the world's earliest surviving railway viaduct — **Laigh Milton Viaduct** over the River Irvine.

ic

The **Edinburgh & Glasgow Railway** opened in February 1842. In securing parliamentary approval and an enabling Act — passed 4th July 1838 — Miller had to deal with cross-examination in court and ongoing technical scrutiny from four formidable English railway engineering consultants — John Urpeth Rastrick (1780-1856), George Stephenson, Charles Vignoles (1793-1875) and Joseph Locke.

Planning for the rail line had begun in 1825 when Miller, aged just 20, had assisted engineer James Jardine (1776-1858) with the surveying of the route, along with Grainger. After many iterations and variations, in 1838 the Edinburgh & Glasgow Railway Company appointed Miller as Engineer, by which time he was 33 years old.

The 72km route from Haymarket in Edinburgh to Queen Street in Glasgow has many bridges, seven viaducts — including its longest structure, **Almond Valley Viaduct** — three tunnels (at Winchburgh, Falkirk and Cowlaers) plus a steep incline at Cowlaers.

At first, the rails were laid on stone blocks set at 1.2m centres. It's likely that Miller



The locomotive depot at Polmont (date unknown), looking northwards. The **Edinburgh & Glasgow Railway** tracks ran this side of the shed.
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was following the preferences of Kastnck, Stephenson, Vignoles and Locke in doing this, though all the stone would be replaced with transverse timber sleepers within a few years. Stone had been used in the early days when horses pulled the rolling stock. However, the blocks sank in soft ground and maintaining constant gauge had been difficult.

Also in 1842, Miller bought the Millfield estate at Polmont in Stirlingshire (now Falkirk), and built a manor house there as a family home — the first asset in his property portfolio. A station at Polmont on the Edinburgh & Glasgow gave Miller easy access.

On 1st August 1846, an Edinburgh extension to the railway opened. It ran 2km east in a tunnel and through Princes Street Gardens to North Bridge Station (later renamed Waverley Station), where it met the **North British Railway**, also engineered by Miller. A 1.6km branch from near Bo'ness (Borrowstounness) to the North British at Causewayend opened on 28th August 1847. And in 1848, one of the Edinburgh & Glasgow's locomotives was named *Miller* in honour of its engineer.

In all, Miller was responsible for 40% of the total length of Scottish railways built before 1843, while Grainger's work accounted for nearly 22%. Miller was now working at a furious pace and he was soon submitting more proposals than any other railway engineer of the time. Just around the corner was the period generally referred to as the years of 'Railway Mania' ...

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The largest structure on the North British Railway
— Dunglass Viaduct

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Roxburgh (Teviot) Viaduct was constructed as
part of the Musselburgh branch of the North
British Railway (1847). Unfortunately, part of it
collapsed during the works, killing eight people.

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The prolific years of Railway Mania

The years 1844-7 are often described as the years of 'Railway Mania', signifying an unprecedented period of railway investment and construction over the whole of the UK. It was a period of economic prosperity in Britain, and long-distance railways were required to further trade. Every town wanted a railway station.

Miller's output at the time was extraordinary — in November 1845 alone he submitted to Parliament proposals for more than 2,400km of railway. This was lucrative work, for even if the proposals never came to fruition, he charged four or five guineas per day for each project, roughly equivalent to £350-£440 per day in 2010. Some engineers charged even more: Robert Stephenson's daily rate was £10.50.

Miller was often in London working on proposals or overseeing Parliamentary Bills. He had an office at 2 Parliament Street in Westminster, in addition to his Edinburgh premises and the Millfield estate in Stirlingshire. His ever-growing workload meant he couldn't oversee every detail of all the projects and he delegated to a team of assistants and resident engineers. In some instances, Miller was blamed for entrusting work to engineers with insufficient experience to ensure competent construction, and his reputation did suffer.

His practice was staffed by a group of young men who went on to become established railway engineers. They included Charles Jopp (1820-95), who worked as an apprentice from 1841-7 and later as chief assistant; apprentice and later senior assistant Benjamin Hall Blyth (1819-66); assistant George Cunningham (1829-97); engineer David Bell and apprentice James Fairlie Blair (1831-76). Cunningham was to have a long association with the Miller family and would marry Miller's eldest daughter Margaret in 1858.

From 1842-9, Miller was Engineer for the North British Railway — the first Scottish railway to reach the English border. North British would eventually own more kilometres of track than any other railway company in Scotland. Its enabling Act of Parliament was passed on 4th July 1844. Both the 92.5km main line from Edinburgh to Berwick upon Tweed in Northumberland, and a 7.2km long branch in East Lothian, from Longniddry to Haddington, opened on 18th June 1846.

As often happened on large railway schemes, Miller's work for the North British was checked by another railway engineer, in this case Robert Stephenson. The route included some steeper gradients than Miller had used before and all its significant structures were specified in ashlar masonry — bridges, tunnels and viaducts, including the largest structure, the Dunglass Viaduct.

However, construction was beset by pay strikes and unrest between the gangs of navvies from the Scottish Highlands and Ireland. Inadequate supervision by contractors and resident engineers added to the problems, and poor workmanship was frequently the result. Criticism began soon after opening — flooding in September 1846 caused widespread damage to a long section of line that included East Linton Bridge in East Lothian, which had to be repaired using a timber structure over the two central spans.

On 21st July 1845, the North British merged with the Edinburgh & Dalkeith Railway (built 1827-31) and took over the planned route for a railway between Edinburgh and Hawick in the Scottish Borders. This was later renamed the Waverley Line as a tribute to Sir Water Scott (1771-1832), whose novel Waverley was published in 1814. The line opened in sections between 1847 and November 1849.

The North British added a branch at Musselburgh in East Lothian in 1847, and a route hugging the Scottish border from Berwick to Kelso was also constructed (1846-50). The latter was connected to the Waverley Line (1849-50) by a line from Newtown (now St Boswells) to Kelso. It included the Roxburgh (Teviot) Viaduct, part of which collapsed during construction killing eight people.

On 5th October 1849, Miller was described as being "desirous of resigning active charge of the company's business and hereafter if the directors should desire it to act only as their consulting engineer". Jopp and Miller's nephew John Miller junior (born 1827, son of his elder brother James) were duly appointed Engineers to the North British in December 1849, a post later occupied by erstwhile Resident Engineer James Bell (1808-85).

Union with England's east coast railways was achieved when the North British joined with the York, Newcastle & Berwick Railway after Queen Victoria opened Stephenson's Royal Border Bridge on 29th August 1850. This event marked the establishment of a route all the way from Edinburgh to London.

From 1845, Miller was working in some capacity on the Dundee & Perth Railway, though not its construction. The railway opened on 22nd May 1847. In 1846 it had

replacing

leased the **Dundee & Newtyle Railway**, built 1826-32 under engineer Charles Landale (1764-1834), and in 1848 it leased Miller's **Dundee & Arbroath Railway** (built 1836-8), subsequently changing its name to the **Dundee & Perth & Aberdeen Junction Railway**.

The year 1845 was especially busy for Miller, and he was appointed Engineer to the proposed **Direct Northern Railway**, one of several contenders for a London to York line — 'direct' because the route via Lincoln was 283km long and the as-the-crow-flies distance between St Paul's Cathedral and York Minster is just over 280km. In 1846, the Direct Northern and the London & York Railway amalgamated to become the **Great Northern Railway**, with Miller as Engineer for the building of the northern half, though he later resigned. He also worked on at least 18 other schemes that were never constructed.

Also in 1845, he became involved with the **Stirlingshire Midland Junction Railway**, which received Royal Assent the following year. It formed a link from the **Edinburgh & Glasgow Railway** at Polmont eastwards to Larbert and Carmuir on the **Scottish Central Railway** (built 1845-8). Miller constructed a swing bridge at Grahamston to carry the Stirlingshire Midland Junction over the **Forth & Clyde Canal** but by the time the line opened on 1st October 1850, he had left the company.

Meanwhile, disputes were raging between competing factions for a trans-border west coast main line. Eventually two railways won the right to cross the border into England at Gretna. They were the **Caledonian Railway** (built 1845-8) and the **Glasgow, Dumfries & Carlisle Railway**, of which Miller was the Engineer from 1846 to August 1849, and acted as a consultant thereafter. He was now responsible for all the through main lines in southern Scotland except the Caledonian.

The Glasgow, Dumfries & Carlisle dates from March 1844. Its enabling Act of Parliament was passed on 16th July 1846 and construction started in 1847. The route began at Cumnock and ended at Gretna Junction — its trains used the Caledonian Railway tracks between Gretna and Carlisle. The line opened on 28th October 1850 and includes the 1.28km long **Drumlanrig Tunnel**, constructed to conceal the railway as it crossed the estate of Walter Francis Montagu Douglas Scott (1806-84), fifth Duke of Buccleuch.

The newly opened Glasgow, Dumfries & Carlisle merged immediately with the adjoining Glasgow, Paisley, Kilmarnock & Ayr to form the **Glasgow & South Western Railway**. This was another railway on which Miller's nephew also worked. Its most impressive structure is the 14-arch **Lugar Water Viaduct** that Miller himself considered to be his greatest work.

All these projects were affected to some extent by the collapse of Railway Mania into the economic depression of 1847-8. Inevitably, the booming prices of railway shares were unsustainable in the long term and schemes were closed to investors. This tended to delay the completion of lines already under construction, and may have influenced Miller's decision to retire.

Although only 43 years old, he was already thinking about retirement by 1849, and he withdrew from the North British Railway in December that year. He had been working at an incredible pace since the 1830s. During 1850, he ended his work commitments with many of the railway companies, and this was the year he chose for his retirement, though he continued with some railway engineering until 1851.

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Miller's wider career

Although Miller's engineering career was predominantly focused on the railways of Scotland, he worked on a number of other projects as a land surveyor and civil engineer. Some of these he undertook with his business partner Thomas Grainger.

Going back to the 1820s, Miller and Grainger had surveyed the land surrounding Hopetoun House (built 1699-1707) in South Queensferry, West Lothian, in 1828. They prepared new estate plans for owner John Hope (1803-43), fifth Earl of Hopetoun. The house was designed by Sir William Bruce (d.1710) and remodelled extensively (1721-67) by William Adam (1689-1748) and his sons.

Between 1829 and 1831, Miller oversaw the building of roads in Ireland, probably in the counties of Cork and Kerry, for Richard John Griffith (1784-1878), Engineer of Public Works in the south west of the country from 1822-36. Some 400km of new roads were constructed in Cork, Kerry, Limerick and Tipperary during Griffith's tenure.

In 1831, Miller and Grainger worked together to report on proposed alterations to the road from Hundalee Smithy, south of Jedburgh in the Scottish Borders, to Whitelee Toll Bar in Northumberland for the Roxburghshire Turnpike Trust. Their plans included putting part of the route through a tunnel.

They worked in tandem again in 1834, reporting on the feasibility of constructing a harbour and dock in Trinity Bay, Edinburgh. The scheme received Royal Assent in July 1836, and was constructed under Grainger's supervision.

The following year Miller reported to the Commissioners of Her Majesty's Woods, who were responsible at the time for all Crown land and properties in Scotland. His work included delivering detailed plans of the estates of Linnithgow Palace (present structure built 1618-22) and Blackness Castle (built c.1445), both in West Lothian.

In 1838, Miller and Grainger prepared plans for alterations, extensions and improvements to Arbroath Harbour — a potential North Sea trade link with their newly completed Dundee & Arbroath and Arbroath & Forfar railways. The harbour had been founded 1394, and its 'new' harbour (begun 1725) now needed reconstruction and enlargement, though Miller and Grainger's scheme was not used. The harbour was rebuilt to James Leslie's (1801-89) design in 1841-6.

Miller was involved in a number of learned and technical societies during the course of his working life. The first was the Royal Scottish Society of Arts. He became a fellow in 1828, aged 23. Grainger also was admitted as a fellow (1827-8) and later became President (1850-1). The society was founded in 1821 and received its incorporation by Royal Charter in 1841. The Arts in its title refer to what were called the 'useful arts' — science, technology, engineering and manufacturing — rather than the fine arts.

In 1828-32, Miller was Secretary of the Society of Scottish Land Surveyors, instituted in 1825. Grainger was Treasurer in 1826-7, and later President. Miller was keen to gain recognition as a professional civil engineer, and became an associate member of the Institution of Civil Engineers in June 1830. He was transferred to full membership in May 1832 and would be the Institution's senior member at his death in 1883.

On 18th January 1841, Miller was elected fellow of the Royal Society of Edinburgh, which was established on 29th March 1783. Grainger became a fellow on 18th March 1850. The last of Miller's technical affiliations came in January 1850, when he was elected fellow of the Society of Antiquaries in Scotland. This society was founded in 1780 by David Steuart Erskine (1742-1829), 11th Earl of Buchan, and was incorporated by Royal Charter three years later.

By the time Miller retired in 1850, although he was only 45, he had been an engineer for 27 years. Through his lucrative railway endeavours and sheer hard work he had amassed a considerable fortune. He now decided to put the money to other uses, to pursue his interest in property and to spend more time with his family.

He was to enjoy a retirement that was almost as long as his working life had been — unlike his fellow engineers Grainger, Brunel, Locke and Robert Stephenson, all of whom died in their fifties, still working. But he was far from spending the time at leisure. The second half of his life would be almost as full of activity as the first.

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Politics

Miller believed in the value of self-improvement through education and he sought to improve the lives of those less fortunate, particularly people local to his many property interests. He was involved with local government at various levels but realised he could have a greater effect as part of the national government in London. Equally importantly, he had the wealth necessary to fund such an ambition.

Two of his contemporaries — **Robert Stephenson** and Joseph Locke — had become Members of Parliament (MPs) in the 1847 general election, and perhaps this strengthened his resolve to seek public office. Stephenson was Conservative MP for Whitby, and would be re-elected in 1852 and 1859. Locke, a Liberal, was joint MP for Honiton continuously until his death in 1860.

Miller always stood as a Liberal Party candidate, though some people — mostly his opponents — thought his views more in accordance with the Conservative Party. As well as expounding Liberal Party ideals, he claimed to be both "independent of all party" and "a progressive conservative".

His first candidature was for the Stirling Burghs (Stirling, Culross, Dunfermline, Inverkeithing and Queensferry) in the 1852 general election, two years after his retirement from engineering. Apparently he had refused to stand for the Ayr Burghs (Ayr, Irvine, Cambelltown, Inverary and Oban), even though he was born in Ayr.

Constituency polling day was 13th July 1852, though, as was common at the time, countrywide voting took place over a few weeks. Miller lost by only 20 votes to fellow Liberal Sir James Anderson (1800-64), a textiles manufacturer and Lord Provost of Glasgow 1848-51.

Miller returned to his estates and devoted the next 13 years to various ventures. During this period, his only son John embarked upon a military career. In November 1858, not quite 18 years old, young John Miller received his commission as an Ensign in the 60th Royal Rifles and served at Dover in Kent and in Ireland.

In June 1861, the regiment departed Liverpool for Quebec in Canada, aboard the SS *Great Eastern*, designed by **Isambard Kingdom Brunel**. Miller would never see his son again. John served in Quebec and Montreal, and was promoted to Lieutenant in May 1863. While travelling home on leave aboard the SS *Edinburgh*, he died suddenly — cause unknown — on 2nd August 1864, aged 23, and was buried at sea.

This tragic event may have been the catalyst for Miller and his family to move away from Polmont, where Millfield House would have been full of reminders of John. The Edinburgh town house he owned at 2 Melville Crescent also was an ideal base for Miller's second attempt at becoming a Member of Parliament.

The 1865 general election came less than a year after the death of Miller's son. Perhaps he needed an all-consuming challenge. By then he was 60 years old and may have decided that it was now or never. His characteristic determination to succeed is shown by a comment at one election meeting, where he said, "I have not been in the habit of retiring from anything that I have set my mind to".

This time he stood for the Edinburgh constituency on a double ticket with Duncan McLaren (1800-86), Lord Provost of Edinburgh 1851-4, and they shared the electioneering costs. Their rivals were the Lord Advocate James Moncrieff (1811-95) and publisher Adam Black (1784-1874), though all four were Liberals. On 13th July 1865, McLaren and Moncrieff won by a combined margin of 982 votes, with Miller taking 23% of the vote.

However, Miller's financial support for McLaren wasn't forgotten and the pair campaigned again for the 1868 general election. They were returned unopposed and entered Parliament on 17th November.

Miller was an MP for six years (parliament could sit for up to seven years at that time). In the House of Commons he spoke about education, religion, the poor and matters related to engineering. During that time, he lived in a town house on Hyde Park Square (probably at No. 33) in Westminster, London.

McLaren turned against him for the 1874 general election and decided to canvass with James Cowan (1816-95), Lord Provost of Edinburgh 1872-4. Miller was persuaded to try for re-election by a number of trade union members who recognised his independent views on schools and the working class. He stood as an Advanced Liberal against McLaren and Cowan, with the Conservative John Hay Athole Macdonald (1836-1919) as the fourth candidate.

Polling day was 5th February 1874, and McLaren and Cowan won by a combined margin of 8,249 votes. Miller won 19% of the vote but didn't stand again.

During his years of retirement, Miller also held various positions in local government. Two of the highest were his appointments as Deputy Lord Lieutenant

for Kincardineshire and Deputy Lord Lieutenant for the City of Edinburgh. He was Commissioner of Supply for Kincardineshire and for Peebles-shire, and a Justice of the Peace for Peebles-shire, Stirlingshire, Kincardineshire and Linlithgowshire.

Miller saw no shame in his lowly origins, saying after his failed attempt to win a seat at the 1852 election, "I have come from the working classes, and I have succeeded to no inheritance but by my own industry". And it proved to be a very wealthy inheritance.

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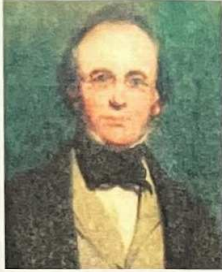
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Church, family and property

Retirement did not mean lack of activity or purpose to Miller. In addition to building up his property portfolio and sitting as a Liberal Member of Parliament (1868-74), he established a military volunteer corps, travelled widely and nurtured his religious, academic and aesthetic interests. Leisure time was there to be filled with instructive pursuits. He was devoted to his family and had worked hard to provide them with a high standard of living. Though he may have missed some of his five children's formative years while he was building railways all over Scotland, he did see their emergence into adulthood.

When Miller retired in 1850 the family lived in Millfield House at Polmont in Stirlingshire. He had bought the estate in 1842 and had the mansion built to his own design. He would now devote a lot of time to improving it. The 1851 census shows it had a staff of nine, plus Miller's secretary Charles Ogilvy (b.1826). One of the staff was governess Elizabeth Donaldson, who taught the four younger children. Margaret, the eldest, was boarding at St Cuthbert's girls' school in Edinburgh.

In 1852, he added a conservatory in the style of **Crystal Palace** (1851) to Millfield, and in around 1858 the house had gas lighting. Millfield would remain in the family until 1870. It was demolished in 1958. Miller also acquired the neighbouring estate of Parkhill and set about refurbishments. The estate included Parkhill House (built c.1790), which is still standing, though now divided into apartments.

Also in 1852, he bought the 5,260ha Leithen Hopes estate at Innerleithen in Peebles-shire, for £57,000, and extended its 16th century manor house to become Leithen Lodge. Then state-of-the-art home comforts included a hydro heating system. A new wing was added in 1885-8, designed by architect Sydney Mitchell (1856-1930) in Scottish Renaissance style. Leithen Hopes remained in the family until 1945.

Miller bought the Drumlithie estate in Kinkardineshire in November 1853. Its 1,130ha and buildings cost around £60,000, and he spent money on land reclamation, drainage and new buildings over the next two decades.

That same year, Miller took the family on a European tour lasting six or seven months, visiting Switzerland, France and Italy, and possibly other countries. He enjoyed travel, at home and overseas, and had the means to do it in style.

Religious faith was an integral part of Miller's character. He was a member of the Church of Scotland well into his forties and had made a substantial financial contribution to the building of a new parish church at Polmont (1844-5). He had been a member of the Polmont Parochial Board — parochial boards were responsible for poor relief before the parish council system was established. However, he had disagreed with church officials over the disposition of funds and other matters.

In Edinburgh, his Melville Crescent house was close to St Andrew's Parish Church, the scene of the 1843 'disruption' that led to the formation of the Free Church of Scotland. Miller may have found this new movement more to his liking — when at Leithen Lodge, he attended Innerleithen Free Church. As he would remark in 1865, "If I regret anything in this world, it is that I was so long a member of the Established Church". He went on, "I do not find fault with the doctrines of the Established Church. I find fault with its government".

In March 1857, together with his family, he cut his ties with the Church of Scotland and joined the congregation of Polmont Free Church (built 1847), where he became an elder in August 1859. Over the years he made many donations, including money for the bell that still hangs in the belfry. The church is south of Polmont Station (on the **Edinburgh & Glasgow Railway**) and is now known as Brightons Parish Church.

Aside from religion, Miller was always keen to promote self-improvement through learning. In 1849 he had helped William Hepburn (1823-90), then gardener at Millfield, to set up the Polmont Mutual Improvement Association. Miller held the positions of vice-president and president, and gave talks on various subjects, including his travels. The association established an extensive free lending library. Hepburn was the librarian, and went on to become editor of the *Falkirk Herald*, followed by other editorial posts in Northumberland and London.

Miller didn't neglect his own cultural development and began to study art. He amassed a significant collection of paintings, books and photographs. In 1856 he was one of the founder members of the Photographic Society of Scotland. Since around 1830, he had been friend and patron of the artist, lithographer and photography pioneer David Octavius Hill (1802-70). He owned many paintings by Hill, some of which he had commissioned, including views of structures on the **Garnkirk & Glasgow Railway**, the **Edinburgh & Glasgow Railway** and the **Glasgow, Dumfries & Carlisle Railway**.

On 14th October 1858, Miller's daughter Margaret married engineer George

Cunningham of Lilliesmuir, Perth, at Polmont Free Church. The couple lived at Parkhill House, where Miller's first grandchild Marjory was born on 11th August 1859. They would produce at least five more — John (b.1861), Isobel (1863), Mary (1865), George (1867) and Bertram (1871).

When war with France seemed imminent in 1860, Miller helped establish the First City of Edinburgh Engineer Volunteer Corps. He was captain, and son-in-law George Cunningham was lieutenant. The corps merged with the First Lanark Engineer Volunteers in 1862 and Miller resigned, but Cunningham stayed on until the combined corps disbanded in 1865. Volunteer corps fêtes were held at Millfield in the September 1860 and 1861.

In around 1864, Miller spent some months in Egypt and Palestine, resigning his duties at the Polmont Free Church on 7th December 1863 to do so. The unexpected death in 1864 of Miller's only son John dealt the whole family a devastating blow. It's possible Miller gained a small measure of consolation from the fact that his nephew John Miller, 13 years older than his son, not only carried on the name but became a railway engineer.

Miller's daughters Jessie and Mary both married in 1874, the year that he left Parliament. Jessie married barrister John Webster (b.1839) of Inner Temple in London on 4th February. Youngest child Mary married farmer Alexander Thomson from Tillicoultry in Clackmananshire on 3rd June, and had at least one child, Claud Muirhead Thomson (b.1881). Both weddings were conducted by leading Free Church minister Dr Robert Buchanan (1802-75) in Miller's Edinburgh house. He settled £10,000 on each daughter as a dowry.

Isabella, after 41 years of marriage to Miller, died on 6th January 1876, aged 76. His second daughter, also Isabella, remained unmarried and lived with her father in Edinburgh, together with six servants. It was here that Miller died after a short illness on 8th May 1883, aged 77.

His fortune, excluding his several properties, was recorded as £37,476 — equivalent to about £2,930,000 (2010). All four surviving children had an equal share of the money, with the Leithen Hopes estate going to Margaret and George Cunningham.

Cunningham would have a long career as a railway engineer and contractor, and to perpetuate the family name, after Miller's death he changed his surname to Miller-Cunningham. The last Miller-Cunningham would be Miller's grandson Sir George Miller-Cunningham (1867-1945), whose only child Grizel Margaret Miller-Cunningham (1910-43) married James Roderick Sinclair (1906-65), 19th Earl of Caithness, in 1933 and changed her surname to Sinclair.

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A second plaque commemorating Miller's work, in addition to the one at Edinburgh's Haymarket Station, was unveiled at Ayr Station in April 2012.

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Appreciation

Writing in *The Railways of Britain* (1961), Jack Simmons expresses the view that Miller "ought to be more widely recognised as one of the great British railway engineers". In an unpublished biography of Miller (2005), Roddy Simpson describes him as "the forgotten man of Scottish railways". And Professor Roland Paxton has said that in his view, Miller is "the greatest designer of masonry viaducts of all time". It is surprising that Miller is not more widely known, considering that by the time of his retirement in 1850 at the age of 45, he had built more railways in Scotland than any other engineer. He had worked hard, confident in his abilities and prescient in realizing the future importance of rail.

Miller embodied the Victorian values of success through self-improvement and education. He approached everything with a determination to succeed, even if events beyond his control sometimes thwarted his ambition. He invested in the railways he built, often becoming a shareholder, but he was also generous with his money.

His father, James Miller, had triumphed over humble beginnings to become a public figure and man of property. This set a compelling example for his son. In retirement, John Miller continued his own life as a public figure, culminating in election as a Member of Parliament. He too used his money to acquire land and property.

Over the years Miller developed into an erudite and cultured man. He enjoyed art, especially painting and the emerging field of photography. For him, learning never stopped and he was keen to help others increase their knowledge too. His financial generosity extended to members of his family, his associates and to the church and, particularly in retirement, he devoted time to worthy causes.

In his will, Miller noted that "as my family were all young during the active part of my life ... it may be interesting to them and perhaps profitable to have a short history of my life drawn up for which there are materials in my Diaries, Memorandum Books and other papers". As no trace of these has been found, many of the details of his life are not known to us.

However, in his lifetime, Miller's achievements were recognised and lauded. In 1852, the *Falkirk Herald* called him "one of the ablest and most celebrated civil engineers in the country".

Jumping forwards, a portrait of Miller by Sir John Watson Gordon (1788-1864) was exhibited on 6th September 2002 at the School of the Built Environment at Heriot-Watt University, Edinburgh. Miller's great great grandson David Cunningham travelled from Australia for the unveiling. This picture is part of the Institution of Civil Engineers Museum in London and is an extended loan from the Scottish Borders Council.

In 2005, a plaque dedicated to Miller was unveiled on Platform 4 of Edinburgh's Haymarket Station by Sarah Boyack MSP. The plaque was commissioned jointly by the Institution of Civil Engineers, Network Rail and ScotRail. Miller's great great granddaughter Paula Clarke and great great great granddaughter Dr Natasha Clarke were among those who attended.

The plaque reads, "In commemoration of the outstanding achievement of John Miller (1805-83), C.E., F.R.S.E. Engineer for most of the early main line railways in Scotland, including the North British, the first line across the border, and the Edinburgh & Glasgow, the first inter-city line, for which Haymarket Station was the Edinburgh terminus from 1842-46. Presented by the Institution of Civil Engineers and dedicated on 26th July 2005, the bicentenary of Miller's birth".

Miller may not have had 'a short history' of his life written until the beginning of this century (*Oxford Dictionary of National Biography*, and *Biographical Dictionary of Civil Engineers in Great Britain and Ireland*, Volume 2 1830-1890) but his memorial is in everything he designed. His legacy to us is that many of his structures are still standing and most of his railways are in daily use, incorporated into the network of Scotland's mainlines.

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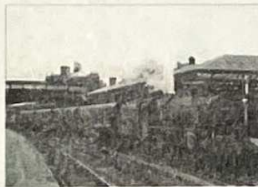
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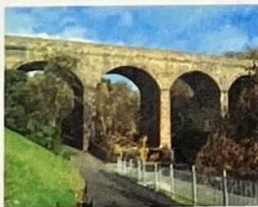
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A train at **Dumfries Station** (1848), built as part of the **Glasgow, Dumfries & Carlisle Railway**, looking south (date unknown)

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Part of the 23-arch **Kilmarnock Viaduct** (1848), built as part of the **Glasgow, Dumfries & Carlisle Railway**

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Selected works

- 1823 Employed as engineer by Thomas Grainger, Edinburgh
- 1824-26 Working with Grainger on **Monkland & Kirkintilloch Railway**
- 1825 Goes into partnership with Thomas Grainger
- 1826-28 **Ballochney Railway**, with Grainger
- 1826-31 **Garnkirk & Glasgow Railway**, with Grainger
- 1828 **Hopetoun House** land survey and estate plan, with Grainger
- 1829-33 **Wishaw & Coltness Railway**, with Grainger
- 1830 **Polloc & Govan Railway**, with Grainger
- 1831 **Jedburgh to Whitelee toll road** for Roxburghshire Turnpike Trust, with Grainger
- 1835-37 **Paisley & Renfrew Railway**, with Grainger
- 1835-38 Engineer to the **Dundee & Arbroath Railway**
- 1837 Proposal for a railway from Montrose to Brechin, with Grainger
- 1837 **Linlithgow Palace and parkland** reports
- 1837 **Blackness Castle and lands** reports
- 1837-43 Engineer to the **Glasgow, Paisley, Kilmarnock & Ayr Railway**, designs locomotives for it (12 built)
- 1838 Plans for improvements to **Arbroath Harbour**, with Grainger
- 1838-42 Engineer to **Edinburgh & Glasgow Railway**, has a locomotive named after him (*Miller*, 1848)
- 1839-41 **Almond Valley Viaduct** ... Edinburgh & Glasgow Railway
- 1839-42 **Winchburgh Tunnel** ... Edinburgh & Glasgow Railway
- 1840-42 **Cowals Incline** ... Edinburgh & Glasgow Railway
- 1844-46 **North British Railway** and branch to Haddington
- 1845-47 **North British Railway**, Edinburgh to Hawick
- 1845-47 Working on **Dundee & Perth Railway** but resigned before construction
- 1845-50 **Stirlingshire Midland Junction Railway**, Polmont to Larbert
- 1845 Puts plans to Parliament for more than 2,400km of railway (November)
- 1845 Partnership with Grainger dissolved
- 1846 **Dunglass Viaduct, East Linton Bridge and Waverley Station**, **North British Railway**
- 1846-47 Directs upgrading of **Kilmarnock & Troon Railway**, which becomes *part of* **Glasgow, Paisley, Kilmarnock & Ayr Railway**
- 1846-48 **Ballochmyle Viaduct** ... Glasgow, Paisley, Kilmarnock & Ayr Railway *expansion to Cumnock*
- 1846-49 Engineer to **Glasgow, Dumfries & Carlisle Railway**, thereafter consultant (to 1850)
- 1846-49 **Glasgow, Paisley, Kilmarnock & Ayr Railway** extension to Cumnock
- 1846-50 **North British Railway** branch to Kelso
- 1847 Adds footways to **Glenesk Bridge** ... North British Railway
- 1847 New viaduct at **Laigh Milton** *on the Kilmarnock & Troon Railway upgrading*
- 1847-48 **Carron Viaduct** ... Glasgow, Dumfries & Carlisle Railway
- 1848 **Kilmarnock Viaduct** ... Glasgow, Paisley, Kilmarnock & Ayr Railway
- 1848 **Dumfries Station** ... Glasgow, Dumfries & Carlisle Railway *late*
- 1848-50 **Drumlanrig Tunnel** ... Glasgow, Dumfries & Carlisle Railway
- 1849-50 **Roxburgh (Tevlot) Viaduct** ... North British Railway
- 1850 **Lugar Water Viaduct** ... Glasgow & South Western Railway
- 1850 Retires, aged 45
- 1852 Unsuccessfully stands for Parliament (seat: Stirling Burghs)
- 1865 Unsuccessfully stands for Parliament (seat: Edinburgh)
- 1868-74 Elected to Parliament (Liberal, Edinburgh with Duncan McLaren)

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