

Chapter Two

Robert Stevenson 1772-1850 - Erector of the Bell Rock lighthouse

Family recollections

Beside the parish church of Neilston, a flat gravestone is marked simply 'NETHER CARSEWELL'. [11] It covers the dust of some of the family's early progenitors. Some miles away a farmhouse called Nether Carswell stands in the beautiful low green hills of Renfrewshire. It is 16 miles from the city of Glasgow. Above the lintel of one of the old buildings the initials of James Stevenson and Marion Andrew with the date 1695 have been cut and recut. On another old barn, above the door, the date 1791 has been incised. It was a prosperous farm in the 17th century and home to their seven children. Generations of farmers worked the land here, turning an inhospitable and unimproved moor into a productive hill farm.



[11] Family gravestone at Neilston, Renfrewshire. 17th century.

Directly descended from James and Marion Andrew is Robert Stevenson, the first of the family to become an engineer.

Robert's early education was at a free charity school in Edinburgh. Later he attended classes at the University in Glasgow. He acknowledged the debt he owed to its founder in a manuscript memoranda:

'It was the practice of Professor Anderson kindly to befriend and forward the views of his pupils; and his attention to me during the few years I had the pleasure of being known to him, was of a very marked kind, for he directed my attention to various pursuits, with the view to my coming forward as an engineer.'⁵

The appearance of many men of great technical ability in Scotland was assisted by the enlightened attitudes in the centres of learning.

One of his old friends who had been his class fellow in Glasgow was Henry Duncan, of Ruthwell, who was the founder of savings banks. Subsequent winters gave him a further opportunity to study at the University of Edinburgh, where he attended the class of Professor John Robison. The Professor's assistant, whose name was Thomson, made him a double barometer, which was left to his son Thomas in his will.

Robert did not receive any academic degree, but he mastered all he needed to know for the practice of civil engineering. He wrote 'I was prevented from following my friend Mr Neill for my degree of MA by my slender knowledge of Latin, in which my highest book was the Orations of Cicero, and by my total want of Greek.'⁶

Robert and Jean, had 13 children but only five-Jane, Alan, Robert, David and Thomas lived to grow up.

With Robert leaving home for such long periods much of the early upbringing of the children was of necessity in Jean's hands. As they came along, she was required by Robert to listen to their lessons, take them for educational trips to Leith, and make sure that they did not get 'over-heated' with their high spirits! Together with Robert's mother she ran a school for the local poor children in Baxter Place for some years. There may have been a lot of religion taught but presumably reading, writing and arithmetic were included. Robert's wife kept herself in the height of fashion and went forth from her house wearing five feet of gold chain round her neck, her deeply embossed gold watch, gold vinaigrette and pearl brooch. As part of her dowry she brought much fine furniture and a wealth of family linen of strong make with an exceptionally elaborate design. The tablecloths, for instance, were embroidered with hunting scenes, and her maiden name was woven in. Her boys too were very fashionably dressed on suitable occasions. In some of the original letters that Robert wrote every few days to his wife when he was separated from her, although many contain only day-to-day events, he included news of his business transactions and gave her an idea as to the date of his return. Some have striking descriptions of fashions current in London or Paris. Writing from London in April 1815 he describes the Princess Royal as:

'dressed in a Pelisse and Bonnet of the same colour of cloth as the boy's dress jackets-trimmed with blue satin ribbands-the hat or bonnet Mr. Spittal said was a Parisian Slouch-and had a plume of three white feathers.'¹⁹

She also shared quietly in her children's laughter, and nursed them devotedly through their many childhood ailments. Robert had lived for twelve years with Jean, his step-sister, before he

married her, and he certainly must have known that housekeeping and coping with hiring competent staff to run Baxter Place would not be easy for her. She devoted too much of her time to religion, and judged everyone she met by the yardstick of her own deep religious convictions. RLS in his book *Family of Engineers* writes hilariously of the strong words used by Robert when meals were burnt by the cook.

Education started for the family as soon as they could talk. Later the boys all attended the High School of Edinburgh. As their time at school or university was ending each of his sons received a letter from their father formally asking for their decision as to what career they wished to follow. All of them were taken on lighthouse voyages with Robert from 12 or 13 years old and were required to take careful notes showing their daily activities. Robert read and criticised them at home. Their travels extended to many parts of Scotland, England, Ireland and France. Janey, who was so much older than her brothers and his only surviving daughter, had an especial place in her father's heart and he gave her every educational opportunity that money could buy. He took her with him when she was 17 years old on his two lighthouse voyages to France. She showed great ability as an artist and her father printed an engraving of one of her drawings in his Bell Rock book.

Robert must have found leaving his home and children behind him very difficult at times. On 31st August 1806, he wrote:

'Carskey Bay. On board the Canal Packet.
Sunday morning 31st August. 1806
My dearest Jeannie,

I am sure from the attention of our friend Mr. Leitch that

our sister Mary and you would have a very pleasant Journey and from the state of the weather you must have found the Journey home much more agreeable than in coming west. At home I trust you found our dear little Family and all our friends well, and as I hope Mr. Leitch gave up his intention of staying at Mr. Halls you will all be very happy; as for myself I feel as well as on former occasions of the like absence from my Family and friends, and comfort myself with the prospect of good weather and a short voyage, which will lead to a happy meeting with you My Dear Jeanie- you would observe that I sailed in the afternoon but owing to the heavy swell of the sea and the wind increasing against us we were obliged to return to our old anchorage about midnight after getting a little below the Cumbracs - had I waited till the middle of the day I might have landed and again taken leave of you, but as this is rather an unpleasant thing I rather got under weigh in the morning and as we stood over to the Island of Bute I dare say you might have observed the vessel. I looked anxiously for the Coach about the hour of its setting off. ...”

When the boys were small they received letters separately written in a large printed script, which they could read themselves, and which were full of instructive but interesting facts from which they might profit.

London 26. May 1816.

My dear Boys,

After writing to you from the Isle of Man, Mr. Neill & I sailed in the Yacht, over a broader part of the sea than the Frith of Forth, & came to a town called Liverpool. Which

has more ships than Leith. The inhabitants of Liverpool are very fond of education, they have many large rooms full of Books, and also a large Botanic Garden, full of curious Plants from all parts of the World. Some of these Plants were brought from Arther's [sic] Seat, & other mountains in Scotland, One which Mr. Neill & I admired much, the Banana, was so large, that it would reach higher than from the floor to the Roof of the Dining room, and one leaf of it would cover James & Mary from head to foot. This plant was brought from the Sandwich Islands, in Captain Cook's Ship, by Sir Joseph Banks. ...”

In this next letter Robert uses his exceptional powers of observation:

‘On Board of the Light House Yacht, Off Kirkwall the Capital of Orkney, Wednesday 31. July 1816.

My Dear Boys

At the towns of McDuff, Banff and Portsoy, many of the houses are built of marble, and the rocks on this part of the coast, or seaside, are marble. But my Dear Boys, unless marble be polished & dressed it is a very coarse looking stone & has no more beauty than common Rock. As proof of this, ask the favour of your Mother to take you to Thomson's Marble Work, in South Leith, & you will see marble in all its stages, & perhaps you may there find Portsoy marble. The use I wish to make of this, is, to tell you, that without education, a man is just like a block of rough unpolished marble. Notice in proof of this, how much Mr. Neill, & Mr. McGregor know, & observe how little a man knows who is not a good schollar [sic]. Be sure that you shake hands with

Mr. Neill when you see him, & make my compliments to him.

On my way to Cullen, a small but pretty little town, I saw a windmill-tower, which a gentleman caused to be erected on his estate, but the people there did not know how to stop the windmill, when it was going very fast, & the whole machinery was broken to pieces. ...³

Robert Stevenson's life is well documented both by himself and his sons, and later by his grandson Louis. He was an elder of the Church of Scotland and once represented Cupar at the General Assembly. Together with his eldest son Alan he set a pattern of family services for lightkeepers; bibles were provided at every station, and missionaries were asked to visit, and later to take books and help with the education of lighthouse children. From Thomas Smith's time religion gave the family of that generation, and the next, a deep compassion for other people. If one of Robert's workmen had an accident he would arrange for a pension to be paid to the widow. During the years of terrible unemployment after the Napoleonic wars he organised the construction of walks on the Calton Hill, an early job-creation scheme.

Robert also seems to have had second sight, or extra-sensory perception, as did his father-in-law Thomas. Thomas arrived at his mother's bedside in Broughty Ferry just a few hours after she had appeared to him in a vision, and just before she died.

Louis writes:

"In the early part of the [19th] century the foreman builder was a young man by the name of George Peebles, a native of Anstruther. My grandfather had placed in him a very high degree of confidence, and he was already designated to be

foreman of the Bell Rock, when, on Christmas-day, 1806, on his way home from Orkney, he was lost in the schooner *Traveller*. The tale of the loss of the *Traveller* is almost a replica of that of the *Elizabeth* of Stromness; like the *Elizabeth* she came as far as Kinnaird Head, was then surprised by a storm, driven back to Orkney, and bilged and sank on the Island of Flotta. It seems it was about the dusk of the day when the ship struck, and many of the crew and passengers were drowned. About the same hour, my grandfather was in his office at the writing-table; and the room beginning to darken, he laid down his pen and fell asleep. In a dream he saw the door open and George Peebles come in, 'reeling to and fro, and staggering like a drunken man,' with water streaming from his head and body to the floor. There it gathered into a wave which, sweeping forward, submerged my grandfather. Well, no matter how deep; versions vary; and at last he awoke, and behold it was a dream! But it may be conceived how profoundly the impression was written even on the mind of a man averse from such ideas, when the news came of the wreck on Flotta and the death of George."⁴

Louis goes on in his *Family of Engineers* to relate that Robert took care of George Peebles' widow and brothers, and was still trying to cope with helping the family as late as 1839 when he finally gave up.

In the first draft of Louis' book *Family of Engineers* he gives a great insight into family life in Baxter Place:

"In this house, Baxter Place, for the better part of half a century, my grandfather led a life of inimitable regularity, only broken by his continual displacements. He rose very

early in the morning, it seems about half past five, put on a shawl-patterned dressing gown, carefully lathered his face, and set off on a round of bed-side visits to his sons. From the innocence of sleep, these were wakened to the dread consciousness of his displeasure, and must listen, from his soapy countenance, to the enumeration of their own misdeeds. This duty performed, and the lather now well soaked in, he would leave his sons to go to sleep again if they were able, return to his own room, shave, and employ himself with his industrious pen till seven. Then he made his usual round of the Calton Hill, and was back by eight for breakfast. From breakfast to dinner he sat close in his office dispatching affairs. Only during the winters of the Bell Rock, was this iron rule relaxed; in those four years, he returned every afternoon to the house and went to bed for an hour's sleep. At five o'clock dinner was served. Up to that hour he was an abstainer from drink; but at dinner port wine made its appearance. 'Of this,' says Mr Swan, 'the old gentleman would take a large allowance, and was never seen to be the worse of it.' He had an evening walk which was no less stereotyped than that of the morning, to the 'Green Tree' some half way to Leith, wrote from seven to nine, and read the London Standard, then about three days old and just about to hand by the mail, till it was time for supper. 'The Baxter Place suppers,' says Mr Swan, 'were very usually of prime cheddar cheese and old Porteous excellent wheaten bread.' A large silver tankard, which had originally been my grandfather Thomas Smith's, was charged initially with two bottles of porter. As the bread and cheese was being consumed, the tankard passed grandly round the table, and when the level of the contained fluid was becoming

inconveniently depressed, it was from time to time replenished by a fresh bottle drawn for that end. At length, when all had taken enough bread and cheese, hot water and 'fine old Jamaica rum' were brought in, and each man, if so disposed, had his tumbler of rum punch. My uncle declared 'there was not a headache in a puncheon of this rum!'

The only surviving child of his widowed mother and educated at home, Mr Swan had a standing invitation to spend the day and dine at Baxter Place on Saturday. If other guests chanced to be present, he and my grandfather, who were about of an age and fast friends, dined by themselves at a side table, enjoying their single glass of port in peace, and were remitted from the obligation to pledge the company by name and in a series."¹¹

Robert belonged to many of the clubs and societies which existed in his time—the Wernerian, Smeatonian, Astronomical, Highland and, of course, the Royal Society of Edinburgh. In 1814 he was a co-founder and director of the Scottish Equitable Insurance Company. Later he was a director of the Sea Insurance Company until 1837, when his son David took over.

The Waterloo Coffee House at the East End of Princes Street was opened in 1820 and was a favourite place for him to meet his large circle of friends.

Robert had a special relationship with Sir Walter Scott whom he first met through the Edinburgh Volunteers of 1795. He invited Scott to accompany him on the *Pharos* for the annual tour round the Scottish lights. They landed on the Bell Rock where Scott inscribed in the visitors book the 'Pharos Loquitor.' Walter's gift to Robert at the end of the voyage was a volume entitled *Some account of the voyage of James V round Scotland*,

under the conduct of that excellent pilot, Alexander Lindsay, first printed in Paris in 1583. The following year Robert invited him again and received this letter of regret:

'Robert Stevenson Esq Architect Edinburgh
Abbotsford 20 July -- [1815]

My dear Sir

I am much obliged to you for thinking so kindly about my voyage and I assure you that the pleasure I promise myself in visiting France under the present extraordinary circumstances scarce compensates for that which I anticipated in our gallant yacht & with my kind friends. But time is precious with me & I have already formed a party for Flanders[,] Waterloo being one of our great objects. It therefore only remains for me to hope that we will one day have another Lighthouse Voyage & to wish you as much happiness & fun & as little sea sickness as the circumstances will admit of Believe me Dear Sir Very much your obliged & faithful

Walter Scott.¹⁴

Robert, so methodical in the keeping of his business ledgers, letters and diaries, neglected to preserve his written communications with his friend:

'I at one time had many notes and letters of Sir Walter's, but they have somehow or other got out of my hands.'¹⁵

In June 1828 Robert and Jean's daughter Jeannie married Dr Adam Warden. This wedding was a very important event for the Stevenson family. Adam had studied surgery in the hospitals in Paris. Later he was appointed aurist to Queen Victoria, probably

because he invented an ingenious medical instrument using lenses for looking into ears. The technical knowledge for this had in fact come from his brother-in-law Alan. Adam Warden was only 25 when he married Jane who was two years older than her husband. They had two daughters and two sons. In Robert's lifetime they lived with their own front door in an extended part of the family house in Baxter Place. Sadly Adam was to die at the height of his distinguished career when he was only 47 years old and only two months before Robert. In his will, extending to over 100 pages, Robert left Jeannie and her children very substantial property. She was to live on until 1864.

Robert saw much of his Warden grandchildren in Baxter Place and mentions them individually in his will.

A most charming letter written by Robert's granddaughter, Jane Warden, thanks him for her birthday present when she was ten years old.

'Edinburgh Feb. 21st. 1840

My dear Grandpapa

I am much obliged to you for the desk and the beautiful Seal which Mama was quite surprised at. I hope to be able to keep it in order, and improve in my writing, and I will be able to write you when you go away in the ship. Mama says I must go to bed as it is near nine O'clock. I remain your affectionate grandchild

Jane Warden.¹⁶

Robert's most important work was the building of the Bell Rock lighthouse. He left an interesting account of it in a quarto volume of 500 pages written by dictation to his daughter Jane. [12] He was 52 years of age before he found the time to write it.

At the age of 77 he started writing about his work from 1811 to 1847 and his unwavering handwriting marks many of the entries. When he tired he dictated this too to Jane. By March 1850 they had completed eight volumes which he presented to his sons with a letter stating 'I set out in this work with the intention of reading each report and marking memoranda after perusal, but I found this irksome and too laborious. So I trusted to my memory. It should all be gone over with a very careful hand.'

In 1842 Robert's wife, Jean, died. He sailed once more on the annual inspection voyage before his official retirement in 1843. The officers and lightkeepers of the Northern Lighthouse Board presented him with a silver tureen inscribed:

AS A MARK OF THEIR RESPECT
FOR HIS STRICT AND IMPARTIAL EXACTION OF DUTY
AS THEIR CHIEF OFFICER
AND ALSO OF THEIR HIGH ESTEEM
FOR ALL THE PRIVATE VIRTUES
WHICH DISTINGUISH HIM AS A MAN

It has a silver lighthouse as a handle on the lid and was left in Robert's will to his eldest son Alan. He did not retire from the separate family business of general engineering until 1846 and he left his three sons as partners.

He wished his sons to be able to conduct themselves like gentlemen, and educated them accordingly. They all had a natural gift of being able to meet and enjoy the company of the men who worked under them. The servants of the Northern Lighthouse Board who came to Edinburgh were always welcomed to breakfast at Baxter Place where they were treated

by Robert with exactly the same hospitality that he gave to his personal friends.

Robert Louis Stevenson had a passionate interest in everything that concerned his grandfather and his grandmother. Although Louis never knew his grandfather, his writings offer a revealing insight into Robert's mind:

"There is an ominous creak of my grandfather's utterances to his grandchildren and nephews which testifies to a mind little at ease. A profound underlying pessimism appears upon enquiry to be the last word of the Stevensons. It does not usually depress them; they are cheerful enough; they have a great gift of enjoyment, but their sense of the tragedy of life is acute and unbroken. My grandfather with his unrivalled digestion, his active regular habits, his eminently detached and mathematic views of religion, may have appeared to an outsider the very type of the sanguine character. But the vulture was within, and almost from the beginning he seems to have regarded the prospects of his sons and nephews with despair."

Robert never properly understood the great need two of his sons had to express themselves in writing on matters other than engineering. Both Alan and Thomas had to hide much of what they wrote from him. Although he would have loved the strange little boy Thomas produced he would have been terribly shocked at the wild behaviour of the teen-aged Louis and would have urged Thomas to be more effective at disciplining his son. He would have been astonished to know that this grandson who refused to follow his own profession would only forty years after his own death carry a name that is a thousand times better known than his own. Today, few people except engineers know

who built the Bell Rock lighthouse or indeed any of the Scottish lighthouses. The initials R.L.S. are known in households round the world.

Robert is recorded as being able to whistle in perfect time while dancing in Baxter Place with one of his beloved grandchildren in his arms. Louis himself missed this experience as he was born only three months after his grandfather's death. The 'time capsule' was wrong.

When the children were very young, summer holidays were spent only a mile away on the clean sandy beaches of Leith. Later, Portobello became the fashionable place. The only holiday that Robert himself is ever known to have taken was spent in Holland. The letters he sent back to his young daughter Janey are an absolute delight. They were printed in the *Scots Magazine* from 1818-21. That he did combine business with pleasure and the civil engineer is evident in much of his notebook. A separate edition dedicated to Janey was privately printed in 1848 containing a facsimile of the gold medal presented to Robert in 1829 by the King of the Netherlands [13] and a neat coloured diagram of Bonaparte's 'Fly Bridge over the Scheldt.'

In his first letter to Janey, Robert was looking back on the town he loved so much as the ship took him down the Firth of Forth. He wrote that no one could be said to know half its beauties who had not seen it from the Roads of Leith, or from the walk round Calton Hill. He said good-bye to the town when the evening sun began to be reflected from the windows of Queen Street as if by ten thousand mirrors.

25th July 1817.

'As seen from the Firth of Forth, the city appears to be set down in an immense amphitheatre, encircled by a range of



[13] Medal presented by the King of the Netherlands, 1829. From Robert's *Journal of a trip to Holland, 1848.*

mountains. On the west we have the hills of Corstorphine, which seem to be separated from those of Fifeshire, as if by some sudden dislocation, to admit the waters of the Forth to empty themselves more freely into the sea. Towards the South the Pentland range holds a commanding place, while Salisbury Crags and Arthur's Seat are seen sloping towards the East, and fall into the sea at the bay of Musselburgh; and still to the Eastward we have the Moorfoot Hills, Traprain Law, and St Abbs Head on the brink of the German Ocean.²⁵

A fine breeze carried the vessel down the Forth, tacking towards the Fife coast, and affording views of Kirkcaldy, Wemyss and Anstruther-passing Fidra, the Lamb and Craigleith, the town of North Berwick, and the Bass Rock. At nightfall a view of Dunbar Castle was before them. The trip that Robert took in these six weeks was formidable and he transports Jane and the

family with superb use of the written word to dozens of places in England and Holland that were foreign to them. Robert referred to his fourteen letters having been, at times, irksome for Jane to read, so much of them being concerned with engineering and similar matters, but there are also many interesting passages, such as these excerpts on the dress of the inhabitants of Rotterdam and of Scheveningen:

Rotterdam, 6th August.

The most remarkable peculiarity in the dress of the people you meet with in the streets, when compared with the costume of England, consists in the men very commonly wearing cocked hats, large metal buttons, and large shoe and knee buckles; the fashions of Holland having all the appearance of being about thirty years behind those of England. The women wear ear-rings, from the size of a pea almost to that of a middle-sized plum; some of the better sort, particularly those from North Holland, have not only ear-rings dangling upon their shoulders, but bands or plates of gold round their foreheads, passing behind the ears and back part of the neck. They generally wear black or white stockings of cotton or silk, with a black or red high-heeled slipper, without any quarter-leather for the heel. They are in general, very cleanly in their apparel.

Hague, 7th August.

Here, instead of the simple English muslin cap, it is common to wear a large straw-hat, measuring about two feet and a half in diameter, suited for all the purposes of the eastern parasol and the northern umbrella, under which they certainly ogled very prettily, with their handsome decorations of large drop ear-rings, pearl-pins at the breast, and not a few with the

gold-plate or clasp of North Holland encircling their foreheads and their ears, even to the back part of the head.¹⁰

Robert's three engineering sons held different views of their talented father. In his *Biographical sketch of the late Robert Stevenson, Esq.*, Alan wrote:

'He was a man of sincere and unobtrusive piety and had perseverance, fortitude and self-denial and an enthusiastic devotion to his calling. Add to this a deep quiet sense of humour and great physical strength. Only once was he known to 'have a cold' and the Doctor said he had to stay inside for a couple of days ...

He hated parties, except in his own house, had a fiery temper, easy to arouse.' [14]

Several portraits exist of Robert in his lifetime, and at least two busts were made. One was placed in the library room in the Bell Rock to his honour and stands now in the entrance hall at the Northern Lighthouse Board, George Street. It was sculpted in marble by Samuel Joseph and was considered by experts to be a perfect piece of sculpture. The face has always seemed to be almost alive. Two passports of 1820 and 1834, issued in France, describe him thus: 'chestnut hair, grey eyes, large nose and generous mouth, round chin in an oval face, ruddy complexion, clean shaven and about 170 centimetres high.' A portrait of him can be seen in the mural cavalcade of the nation's famous men and women, painted by William Hole in the entrance hall of the National Portrait Gallery, Queen Street. He is marching along in good company, and carrying a model of the Bell Rock! Two memorial windows exist, one in St Giles Cathedral, Edinburgh and another in Glasgow Cathedral.

Robert Stevenson is buried in the New Calton Cemetery in 'The Gated Cell' beside his wife. He enlarged the family vault:

'The Tomb or Burying Ground belonging to me in Calton New Burying ground already occupied in part by my own immediate family-and the Co-lateral family of Dr Warden-may in the opinion of the Recorder of the Burying Ground be found sufficient for the several members of my family viz: Mrs Warden, Alan, Robert, David, and Thomas Stevenson-yet to render this more certain and from the earnest desire which I feel, that it should be so-and that we may continue to unite in "Peace" at death, as we have happily done through life-I am endeavouring to acquire the enlargement of the said Burying ground toward the west, and to extend the present enclosure in that direction-as the ground on the south and North is already fully occupied by others. For the particulars of this Burying ground see my private Ledger folio 74.'³⁵

Robert had moved the graves of his family to the new site when he successfully fought the battle to get an extension east from Princes Street and Waterloo Place to carry the road through the Old Cemetery and round the sweep of the Calton Hill along what is now Regent Road to London Road. It was a tremendous engineering task to build up the road and carry it safely over the ravines and round what was called 'The Panoramic Highway.' Lord Cockburn said: 'The effect was like the drawing up of the curtain of a theatre.'³⁶ The Regent Arch is a colossal bridge of stone, a processional way fit for the capital. It is also a successful effort to build public works in the Roman manner, before new large structures, such as the Crystal Palace and the London underground railways, were realised in iron and steel.

There is a Disposition and Settlement of Robert's Estate on the 13th December 1850.³⁷ The house at Baxter Place was furnished with every comfort and luxury available at the time as we can see from the individual bequests he left for his children and grandchildren. Although he disliked attending 'social' events, dinner parties from his own mansion were given in fine style. Guests were required to use the 'finger glasses' that his daughter had asked him to get while she was still unmarried. Several sets of silver are mentioned, silver salvers and also silver handled dessert knives and forks, also best sets of tea and coffee cups. To all the family went numerous pictures, wall mirrors, carpets, sofas, coffee tables, wine decanters and of course his well filled wine cellar. He owned several hundred books in individual book-cases all round the house and he gives the titles of many. Some were very rare when Robert bought them and they would be priceless now. To David he left his *Universal history* in sixty-seven volumes, including two volumes of supplement and a folio of maps; 'This book,' the will states, 'is rarely to be met with in a complete state-it was purchased by me while attending the Natural Philosophy class in the College of Glasgow, I think in 1791.'

The great scope and variety of his children's general knowledge and varied interests in life are revealed in the list of the literature he owned. He had more books on literary subjects, including travels, novels such as *Don Quixote*, and Scott's *Lord of the Isles*, than any other. Several histories, both Maitland's and Kincaid's histories of Edinburgh, and almost as many of a scientific or philosophic nature such as Newton's *Works*, Serres's translation of Bougard's *The little sea torch light*, and *The skilful pilot*, and Barlow's *An exact survey of the tide*. He also owned a number of religious titles. Other technical books which he

possessed were considered the property of the firm and kept separately at the office.

Dr Bob [Robert] was remembered equally with the others by his father and was left enough articles of every variety to furnish a whole house. Thoughtfully he added in the will: 'In case my dear son Robert should not have retired from the army at the time of my death some of the foregoing articles bequeathed to him may be considered cumbersome, and others may not be thought to be soon found useful to him: But let him consider, that the less bulky articles can be taken charge of by his sister Mrs Warden and the rest being carefully packed and labelled can be sent to the Lighthouse Store, Leith, to lie for him as was done with the late G. C. Scott's books etc where they lay many years, in good order, waiting his return from Italy.'

Bob did in fact die tragically only one year after his father. He had contracted a fatal illness in India but got back home to Edinburgh in 1851. Robert Alan Moubray Stevenson, Robert Louis Stevenson and Robert [Bob] Stevenson were the only descendants of the dynasty who did not enter into the world of civil engineering.

A professional aspect

Robert, in common with other engineers of his generation, was a largely self-taught civil engineer of the practical school. He gained an engineering related education by part-time attendance at professor John Anderson's classes in natural philosophy at Glasgow University in 1792-94. From 1800-04 he attended classes in natural philosophy, mathematics, chemistry and natural history at Edinburgh University. By the time he had completed these studies he was 32 years of age. Before embarking on an engineering career he had been apprenticed to

an Edinburgh gunsmith and was himself described as such until c. 1791 when he began to work in Thomas Smith's lamp-making business. By 1794 he had gained experience of lamp installation at Portpatrick harbour and on the erection and illumination of Pentland Skerries lighthouse. From 1796-1802 he was formally apprenticed to Thomas as a tinsmith. In this capacity, but with much more responsibility than was usually undertaken by an apprentice, he continued to specialise in lighthouse work, making reflectors, installing lamps and assisting with arrangements for the erection of lighthouses.

In 1797 Robert was entrusted by Thomas with the installation of the lamp at Cloch lighthouse. On its successful completion he was allowed much greater autonomy in lighthouse work. By 1800 his progress was such that Thomas took him into partnership, even though he was technically still an apprentice. At the same time Robert was also trying to gain approval for building a lighthouse on the Bell Rock, eleven miles off Arbroath. This was an outstandingly difficult engineering challenge made even greater by the fact that the rock was submerged to a depth of not less than about 12 feet during every tide.

In 1799 Robert proposed a beacon-style lighthouse on cast iron pillars for the Bell Rock. However, in 1800, after seeing the rock, and considering the possible damage to such a structure by ships, he abandoned this idea in favour of a stone tower following the general concept of John Smeaton's Eddystone Lighthouse completed in 1759. As part of the design and promotional process for the project he had both proposals accurately modelled, a practice which he often employed subsequently on important maritime and bridge works. Soon

after the models were made he showed them to John Rennie (1761-1821) a leading engineer on maritime work, who expressed a decided preference for a stone tower.

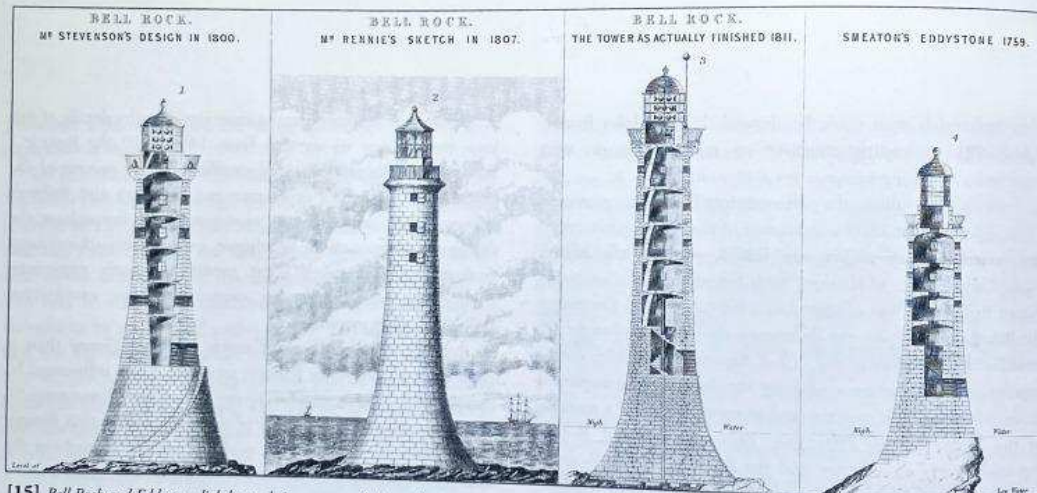
Following the failure of a parliamentary Bill for the provision of the lighthouse in 1803 and because of the project's hazardous and unprecedented nature the Board, on Robert's advice, secured the services of Rennie. With his support, the necessary Act of Parliament was obtained in 1806¹⁸ and on 3 December the Board resolved that the lighthouse *shall be erected under the direction of John Rennie, Esq., Civil Engineer whom they hereby appoint chief engineer for conducting the work*. He was requested to furnish plans, visit quarries and to report back. At a meeting of the Board on 26 December 1806, Rennie and Robert reported jointly on quarries, and the Board agreed to Rennie's proposal *that Mr Stevenson should be appointed assistant engineer to execute the work under his superintendence*.¹⁹ The lighthouse, completed in 1811, was to prove Robert's most important engineering achievement.

Although the above terms of reference seem clear, the relative roles of Rennie and Robert in creating the Bell Rock lighthouse subsequently became a controversial issue between their families. The matter came into public prominence in 1848 when the Stevensons objected to Sir John Rennie's assertion, in his book on Plymouth Breakwater,²⁰ that his father had *designed and built* the lighthouse. Robert's sons lost no time in claiming this merit for their father through the columns of the *Civil Engineer & Architect's Journal*.²¹ The issue was still very much alive at the time of D. Alan's death in 1971. On several occasions both he and the late James Rennie FICE urged the author that if he ever wrote about this matter he should make it very clear that it was their forefather who designed and built the lighthouse!

It would be inappropriate to enter into lengthy details of this issue here, except to say that from 1806-1810 the Rennie - Stevenson combination proved excellent for the success of the project. With Rennie's experience and direction and Robert's energy, ability and assiduous superintendence throughout the design and erection of the lighthouse, a remarkable achievement evolved which reflects great credit on both engineers, particularly on Robert for overcoming the exceptional difficulties of its execution.

Rennie's role was however much more significant than it came to be portrayed by Robert's sons and others influenced by them, that is, as only an *advising engineer in case of emergency*.^{22,23} It is now evident from a study of the early records that Rennie competently exercised his role as chief engineer throughout the duration of the work by means of meetings, visits, reports and a large correspondence. Contrary to the impression given by the Stevensons,²⁴ he inspected the works at least twice during the crucial early construction of the tower. His notebook records him at the rock on 25 November 1808 *ordering* the replacement of Roman Cement to masonry joints.²⁵ He is also said to have been at the works on 29 September 1809,²⁶ when the tower was about 30 ft. high and in a report of 2 October 1809²⁷ [omitted from Robert's *Account* of 1824], informed the Commissioners of his directions in respect of fundamental design features, including the internal construction of the tower.

Rennie's main design contribution was, in general, to adhere more closely to Smeaton's Eddystone design which had stood the test of time rather than Robert's laterally undovetailed proposal of 1800 used in obtaining the Act in 1806.[15] In determining the external shape of the as-built tower Rennie adopted much greater curvature near the base than in both Smeaton's and



[15] Bell Rock and Eddystone lighthouse designs compared. From the *Civil Engineer & Architect's Journal*, 1849. Note the similarities between the as built tower shape and Rennie's initial design and between the as built interior and Smeaton's.

Robert's designs, which by directing the waves upwards dissipated their energy more effectively. The narrower tower in the wave action zone tower also had the advantage of reducing the area upon which the waves acted. From the illustration [15] it can be seen that the sides of Rennie's initial design, and the lighthouse as built, rise from the rock at about 40 degrees from the horizontal, compared with about 70 degrees for Smeaton's and Robert's designs.

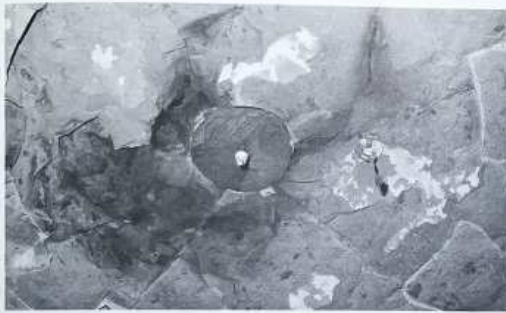
Rennie also incorporated greater lateral strength in the tower by means of horizontally dove-tailed masonry throughout its base to a height of about 45ft, and also, to the centres of the apartment floor cantilevers above, the latter being a modification to what was essentially an innovation of Robert's.

[16] Within Rennie's broad parameters and direction Robert

carried out almost all of the detailed design for the project.

This involved making many decisions on his own initiative and he undoubtedly had autonomy in the matter of fixtures and fittings [17,18] and was solely responsible for planning and executing the impressive shore base and signal tower at Arbroath.

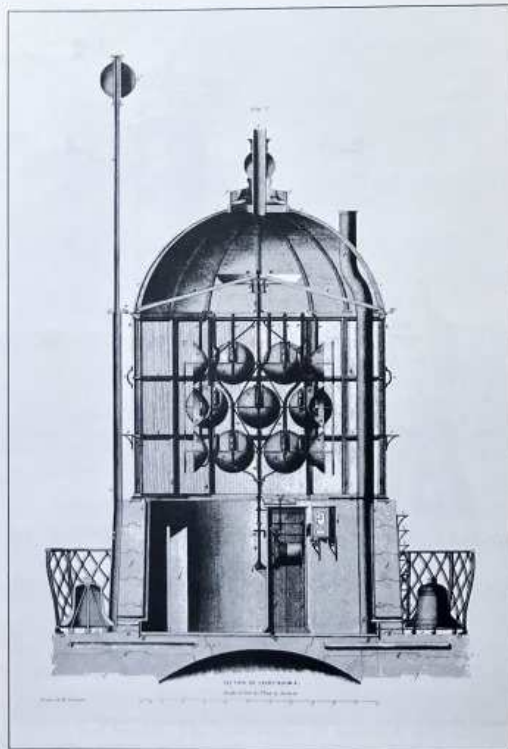
Remarkable engineering innovations introduced at the works under Robert's direction and which greatly facilitated construction included, the temporary beacon barrack, and elevated cast iron railways for transporting materials across the rugged surface of the rock. [19] Also, ingenious and highly efficient moveable jib cranes and an iron balance crane, the latter, with a moveable counter balance weight, being a forerunner of the modern tower crane.



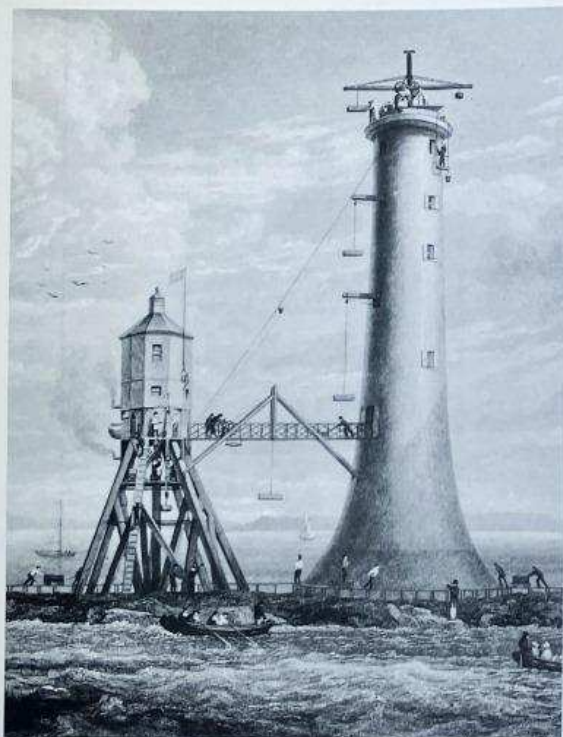
[16] Bell Rock Lighthouse - kitchen roof after the fire in 1989. Note the cantilever end dovetailing. This was a modification by Rennie to what was essentially an innovative feature of Robert's design of 1800.

Robert may have conceived the idea of some or all of these innovations and certainly superintended their provision and use, but there is evidence from the clerk of works David Logan (c.1786 - 1839), who later became a chief engineer, that the cranes used were invented by foreman millwright Francis Watt and that he also designed and made the beacon and probably the railway.²⁹ This attribution attracts support from a letter of January 1808 in which Robert wrote to Watt, *so soon as you have got a proper draught of the crane, of the rock and railway, and of the wooden house for the beacon - come this way [to Edinburgh].*³⁰

[20] Robert does not seem to have specifically claimed the invention of the cranes for himself or to have acknowledged this to Watt, but did claim that they were made from his designs, perhaps he meant in a proprietary sense. In time he became credited with their invention.^{31,32}



[17] Bell Rock lightroom with fixtures and fittings to Robert's design. From Robert's Account, 1824. XX.

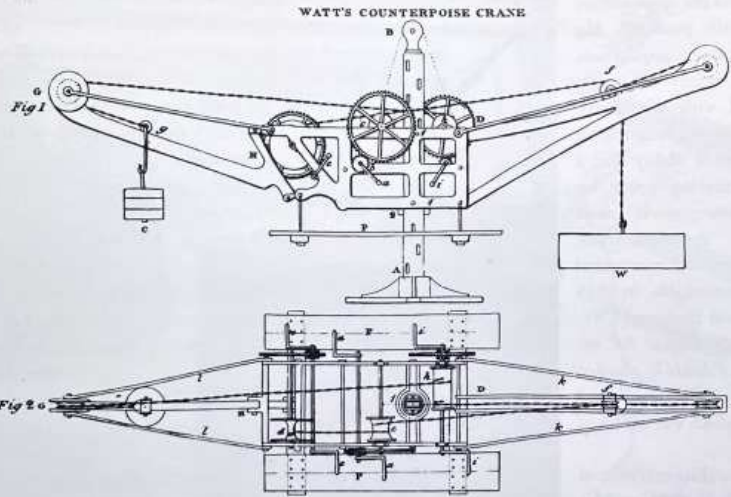


[19] Bell Rock works, August 1810, showing stones being transported from railway to tower top. From Robert's Account, 1824. Foreman millwright Francis Watt can be seen giving instructions at the beacon base.

Robert's definitive *Account of the Bell Rock Light-House*, in which the various operations and intricate machinery and equipment used on the work were described and profusely illustrated by the best artists and engravers, was eventually published in 1824. The work took thirteen years to come to fruition, and it was perhaps not a coincidence that its publication occurred three years after Rennie's death as he is most unlikely to have approved of it.

As befitting a great achievement, the book was dedicated to King George IV, with a frontispiece from a specially commissioned, and since it was acquired by the National Galleries of Scotland now well known, watercolour by J. M. W. Turner, for which the artist asked Robert 30 guineas.³³ The book also generated an input about the use of the word *situate* from Walter Scott resulting in a *miscorrection* considered by Louis to *blot the page*⁶ of the dedication, a verse written by Scott in 1814, and a ballad about *Sir Ralph the Rover* by Robert Southey. Although only 300 copies were printed, the book was widely distributed to influential recipients and, in addition to being a valuable work of reference, added lustre to Robert's reputation and gained him a gold medal from the King of the Netherlands [13].

Robert was perceived in some quarters, as having not sufficiently acknowledged the contributions of Rennie and foreman millwright Francis Watt. This led to unfavourable comment in various publications,³⁷ which eventually reached a much wider readership through Smiles' *Lives of the Engineers*. Smiles commented, with some justification, that the credit for the lighthouse was *almost exclusively* given to Robert, because Rennie was *in a great measure ignored* in Robert's *Account of the Bell Rock Lighthouse* and concluded that he *should not be deprived*



[20] Watt's counterpoise crane used at Bell Rock Lighthouse.²⁶ From a drawing by David Logan published in 1821. Its design differs in detail from that shown in [19].

of whatever merit belonged to him as chief engineer.²⁶ David seems to have disputed with Smiles that Rennie had not acted as chief engineer for the work, but did not manage to persuade him of this and Smiles' comments were repeated in subsequent editions of the *Lives* down to the present time. This perhaps helps to explain the lack of interest by historians outwith the family in the broad ranging achievements of the Stevenson engineers until recently.

The successful completion of the lighthouse enabled Robert, from 1811, to establish within a decade, an indigenous civil engineering practice of sufficient importance to make modest inroads even into the work of the London based practices of Telford and Rennie. The firm which he founded, with changes of partners from time to time, practised continuously until 1952.

To create an engineering dynasty which flourished for nearly a century and a half required the extraordinary talents which Robert undoubtedly possessed. His success was based on his ardent acquisition, application and promotion of largely self-taught practical knowledge, combined with shrewdness, ambition, determination, hard work, outstanding entrepreneurial flair and managerial ability and a good financial start. In engineering terms his strengths related to maritime work, river improvement and inland communication, particularly bridges. His theoretical and mechanical engineering attributes were less remarkable. In 1825 when invited by the scientist David Brewster (1781-1868) to write the article *Steam Engine* for the *Edinburgh Encyclopedia* he replied *I should be afraid of disappointing you every way*⁴ and offered him instead an article on suspension bridges, which was not taken up.

As engineer and, in those days, chief executive of the Northern Lighthouse Board from 1808 until his resignation in 1843, Robert can be considered to have inaugurated the modern lighthouse service in Scotland. He even had the ultimate in status symbols, his own shipping flag, the sight of which no doubt stirred many a lighthouse keeper into a flurry of activity. [21] During his period in office Robert was responsible for the design and construction of at least 23 lighthouses, of which that at Cape Wrath built by John and Alexander Gibb of Aberdeen is a fine example in the north. [22] and the rebuilding between 1821 and 1830 of five of the early lighthouses including Mull of Kintyre. In the field of lighthouse



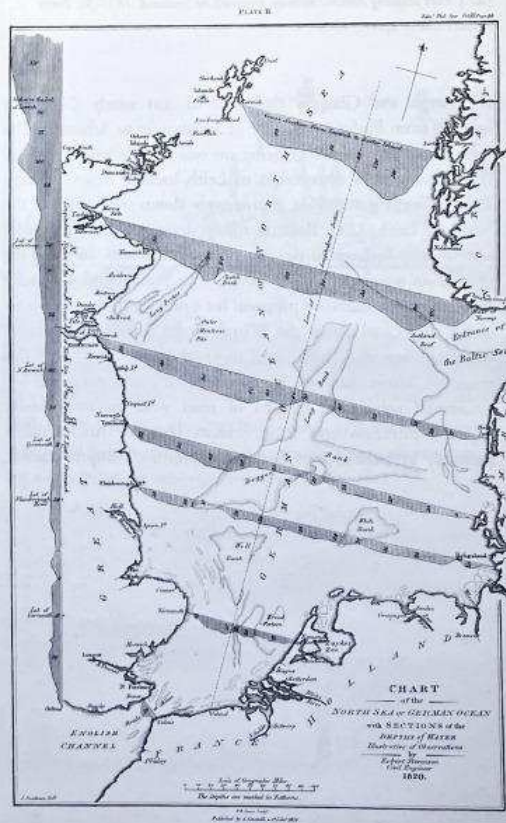
[23] *North Berwick Harbour, improved c. 1812. Robert's specification for rebuilding the destroyed north pier (on right) is dated 5 Aug. 1812. The extent to which it was implemented is uncertain.*

illumination he improved on Thomas Smith's work and brought the catoptric system, that is using silvered-copper parabolic reflectors and Argand lamps, to a high degree of perfection. In order to distinguish between the ever increasing number of lights he invented *intermittent* and *flashing* lights, distinctions which are still in use.

With the possible exception of bridges, maritime and river engineering represented the largest and most successful element of the firm's general practice. From 1838, when David entered the partnership, Robert's contribution to the firm diminished and ended with his retreat in 1846. The numerous harbours upon which the firm reported under Robert's stewardship, and in many cases improved, included Stonehaven, Dundee, North Berwick [23], Rothesay, Grangemouth, Leith, Peterhead, Lossiemouth, Fraserburgh, Ayr, Aberdeen, Kirkwall, Sunderland, Ballyshannon, Perth, Granton and Chester. The firm became pre-eminent in river engineering in northern England and Scotland having worked on navigational improvements for the Tay, Forth, Severn, Ribble, Lune, Dee, Tees, Wear, Erne and the Dornoch and Pentland firths.

State of the art maritime work by Robert included the design and construction in 1821 of a sea wall at Trinity, near Edinburgh, with a cycloidal curve vertical profile which represented an improvement on common walls. Rennie had drawn his attention to the advantage of this profile in November 1806 in connection with the curvature of the Bell Rock lighthouse. Robert also made experiments on the destruction of timber by the *limnoria terebrans* which influenced the general adoption of greenheart for marine timberwork. For most of his professional life he had a consuming interest in coastal erosion and its causes based on a study of the bed of the North Sea. [24] This interest resulted in papers to the Wernerian Society and British Association from 1816 (See Appendix 1).

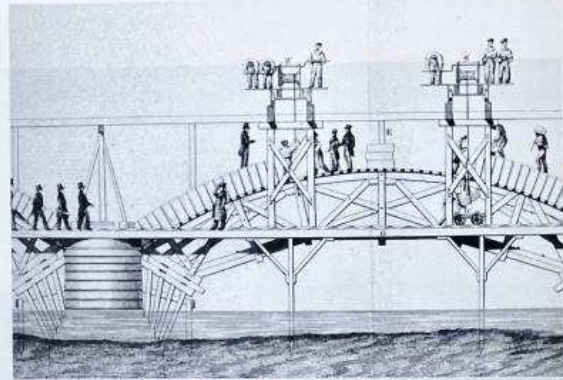
In the early years of the firm Robert engaged extensively on canal, road and rail-road projects, often adopting a promotional role. Before 1818 he had made proposals for a canal between



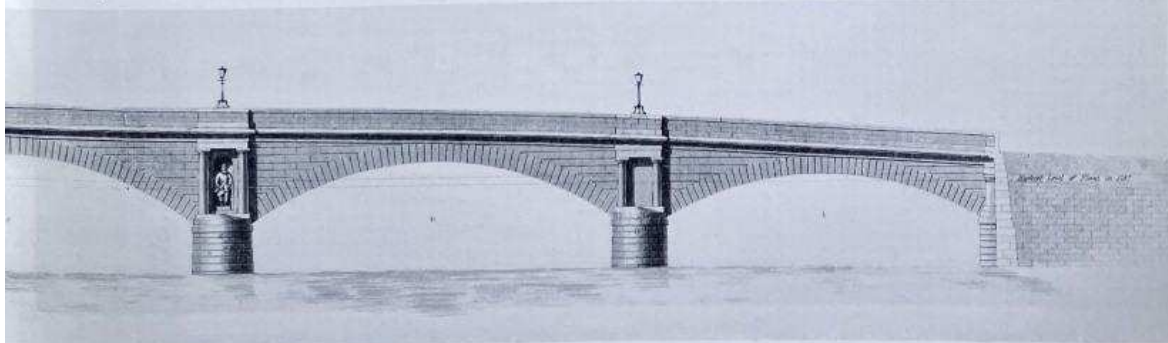
[24] Chart of North Sea, 1820.

was at the forefront of national practice. His road making was similar to but more substantial than that advocated increasingly by John L. McAdam from 1811. Robert's specification for nearly a mile of new road from 16-20 feet wide at Marykirk, Kincardine, dated 12 February 1813 read, *The Reporter makes some alterations upon the common and ordinary method of breaking and laying road materials by reducing the road metal to a more uniform size and using a [3 inch] course of gravel if it can be procured or even of clean sharp sand as a bottoming for the [10 inch layer of] broken stones [which were to be blinded with a 2 inch layer of gravel]. He addressed the evil of incompetent roadmaking and emphasised the importance of seeing that new roads are formed and executed upon proper principles.*

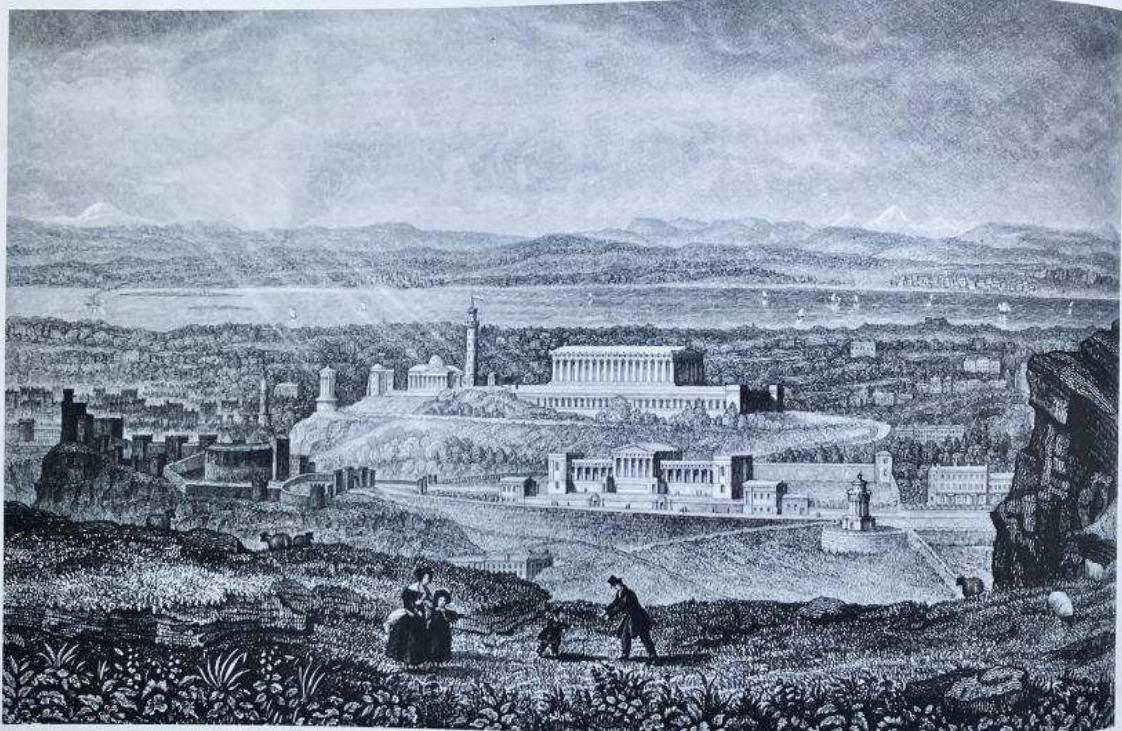
Robert further advised that *A road composed of stones of various sizes can never be brought into that smooth and uniform surface which is so much (sought) after, for the moment the pressure*



[29] Hutchison Bridge works, 1832. With inspection by Robert and party. Note the Bell Rock works influence in the use of railways for transporting stones and moving the winches transversely. From Weale's Bridges, 1843.

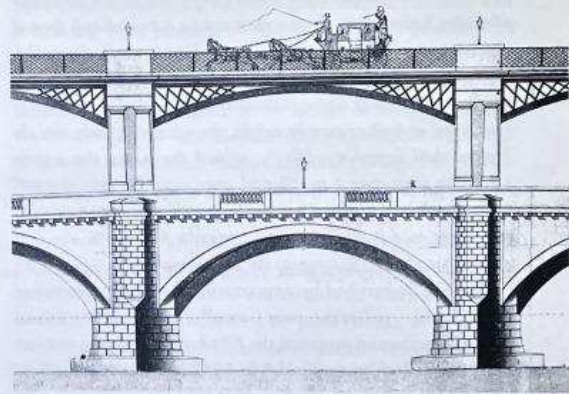
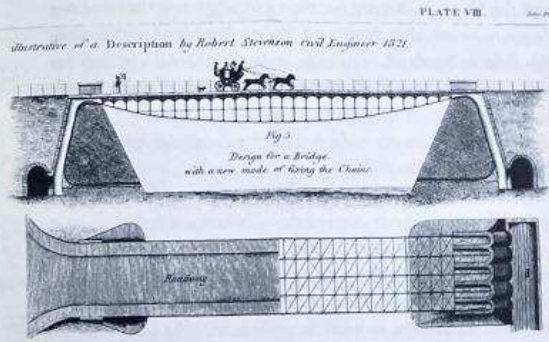


[28] Hutchison Bridge, Glasgow, 1834-68. From Weale's Bridges, 1843.

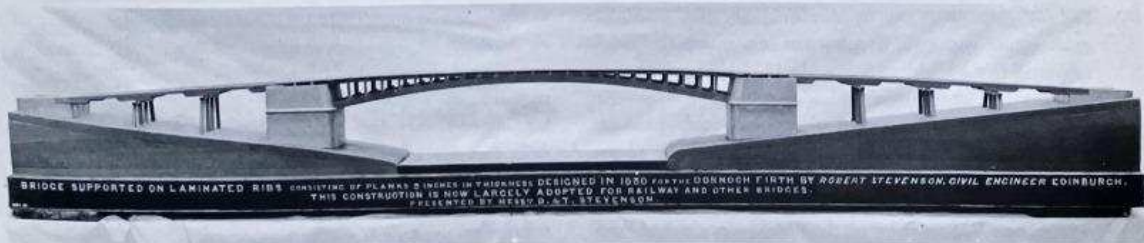


[33] Regent Road approach via Calton Hill into Edinburgh 1815-19. Note the massive retaining wall required in front of the new High School. Engraving of a drawing by G.M. Kemp, 'Calton Hill . . . with the National Monument as it would appear if completed,' 1843.

[39] Underspanned suspension bridge proposal for crossing the r. Almond, near Edinburgh, 1820.



[37] Proposed cast iron roadway on existing bridge at Newcastle-on-Tyne, 1828.



[38] Model of proposed laminated timber arch bridge at Dornoch Firth, 1830.

is brought upon one or other of these out-sized stones it must either be crushed under the wheel or be forced by repeated attacks into the road and thereby displaces the surrounding stones and in either case admission is given to the surface matter, a pit is immediately formed and every succeeding wheel widens the breach until the road is reduced impassible. To counteract this very common effect arising chiefly from the very vague manner of defining the dimensions of road metal by bulk or even by weight, the reporter provides that the Trustees shall furnish a riddle . . . of such dimensions that a stone measuring more than 1 in [38mm] upon any of its sides can(not) pass through it . . . when a pressure is brought upon any particular part of the road it acts with a perpendicular force in the direction of gravity and tends to compress the whole regularly.³⁵

By 1818 Robert had become convinced of the superiority of horse-drawn railways over small canals for inland communication and proposed the *Edinburgh Railway* to connect with the Midlothian coalfield.³⁶ In 1819 he proposed a railway between Montrose and Brechin. [26] His reputation was now such that he was called in as a consultant to advise on proposals such as the Stockton & Darlington Railway and the Elgin Railway extension.³⁷ About this time he also edited for publication, with *Notes*, numerous *Essays on Rail-Roads* submitted to the Highland Society. In 1823 when consulted by Sir John Sinclair about an inland communication between Edinburgh and London, Robert advised that a railway was not only much more practicable but more commodious and useful for general intercourse than a canal.³⁸

By 1836 the lines of railway proposed in Robert's various reports traversed Scotland from the Tweed valley north to Perth and Aberdeen and from Edinburgh westwards to Stirling and

Glasgow, more or less on the lines of the eventual network. [27] However, the estimated costs of his proposals were considerable and the financial climate for their execution was unfavourable. As steam locomotion developed, Robert lost his pre-eminence in this field in Scotland. His only railway proposal executed was the short Newton Colliery line from Little France on the Dalkeith road near Edinburgh, although his *Edinburgh Railway* work [35] to some extent facilitated the successful *Edinburgh & Dalkeith Railway* in 1831.

Robert's design practice for railways was basically the same as for canals and followed the traditional practice of Jessop, Rennie and Telford. He proposed lines as near level as practicable, avoided the use of heavy rolling stock to reduce track damage and designed inclined planes with stationary steam engines to overcome differences in level. As early as 1818 he advocated the adoption of 12 ft. long malleable iron edge rails in preference to the short cast iron rails then in common use.

In 1821 George Stephenson (1781-1848), in acknowledging Robert's influence on Birkinshaw's epoch-making malleable iron forerunner of the modern edge rail, paid him the tribute, *you have been at more trouble than any man I know of in searching into the utility of railways.*³⁹ However, by the following year his son Robert Stephenson (1803-59) who had conferred with Robert as consultant for the Stockton & Darlington Railway was rather less complimentary. After learning by enquiry that Mr Stevenson had surveyed an immense quantity [of railways] but had not had the good fortune to get them into action, he wrote to William James, projector of the Liverpool & Manchester Railway, *If he has executed any railway it must be of very trivial consequence. I hope we shall be able to keep him out of the Liverpool concern.*⁴⁰

Robert's bridge engineering and highway planning in Scotland were more successful. His many projects, by no means all of which were executed, included two large bridges over the River Clyde at Glasgow. These were Hutcheson Bridge (1834-68) [28,29] and the 32ft. wide 14-span timber bridge (1832-46) erected at Portland Street [30] to accommodate traffic whilst Broomielaw Bridge was being built under Telford's direction. This timber bridge, one of the largest of its type in terms of width, proved so convenient for pedestrians that it was retained in use until 1846. Hutcheson Bridge erected by Robert's former assistant John Steedman as contractor for about £24,000 was considered one of the best examples of the segmental masonry arch bridge type in Britain. Unfortunately the bridge had a life of only 34 years because deepening of the river for navigation purposes undermined its piers.

Another fine example of Robert's work is the bridge over the River Forth at Stirling (1829-32) constructed by Kenneth Mathieson for about £17,000 and for which he also planned its town approach. The bridge still carries main road traffic. [31] This approach is not as imposing as Robert's earlier London and Regent Road approaches into central Edinburgh skirting Calton Hill, his proposals for which included sketch elevations of housing terraces [32] and open parapets at Regent's Bridge to enable its users to enjoy the fine views. From 1815-1819 he engineered the Regent Road approach, a work of particular difficulty because of its line and level, severance of Old Calton cemetery, extensive rock blasting and requirement of a massive retaining wall in front of the new High School. [33,34] He also provided the engineering input to Regent's Bridge for which the architect was Archibald Elliot.

Segmental arches characterise the style of Robert's masonry bridges, other fine examples of which still exist at Marykirk 1814 [35], Annan 1827, Allanton 1842, and on a smaller scale at Kearvaig 1828 executed by Alexander Gibb of Aberdeen on the Cape Wrath lighthouse access road. [36] The impressive Stannochy bridge c. 1824 near Brechin, if not by Robert, was almost certainly influenced by the design of Marykirk bridge. Similar arch profiles were adopted in his proposals for the Bridge of Don at Old Aberdeen 1823, Canonmills Bridge 1812-34 on a new northern approach to Edinburgh and in using iron for increasing the traffic capacity of existing bridges at Newcastle-upon-Tyne [37], Perth 1827 and North Bridge, Edinburgh 1832. State of the art designs by Robert for other bridge types included a slender laminated timber arch for Dornoch Firth in 1830 [38] probably influenced by John Green's work and, in 1820, a new type of underspanned suspension bridge. [39]

This new type of suspension bridge, which was originally intended for crossing the River Almond at Cramond near Edinburgh, was novel in that its roadway superstructure, a cast iron framework, rested on the chains rather than being suspended from them. This proposal together with Robert's authoritative accounts of other suspension bridges was publicised throughout Europe in his *Description of bridges of suspension*, 1821. Although not executed, several underspanned suspension bridges were erected in Europe and India by 1870 and in Britain numerous small spans on the truss principle which developed from the concept, the earliest by Robert being Abbey St. Bathans, Berwickshire c.1834. His publication encouraged the development of suspension bridges generally.

After Rennie's death for about two decades Robert can be

considered second only to the Telford-Gibb combination as the leading bridge engineer practising in Scotland. By c. 1830 his office library of bridge books was probably second to none in Britain. Robert's bridge practice of all types was further disseminated in a major contribution to the most comprehensive and influential work of its day, Weale's *The theory, practice and architecture of bridges* published in London from 1839. This work carried Robert's portrait as a frontispiece and five of his bridges were illustrated on 18 plates. His executed work, amounting to more than twenty bridges, was basically of state of the art traditional rather than innovative design.

More unusual tall structures than lighthouses upon which Robert advised in his private practice were the severely cracked tower of Montrose church (1811), Arbroath Abbey ruins (1815) and, his tallest memorial, the magnificent Melville monument which adorns St. Andrew Square, Edinburgh.

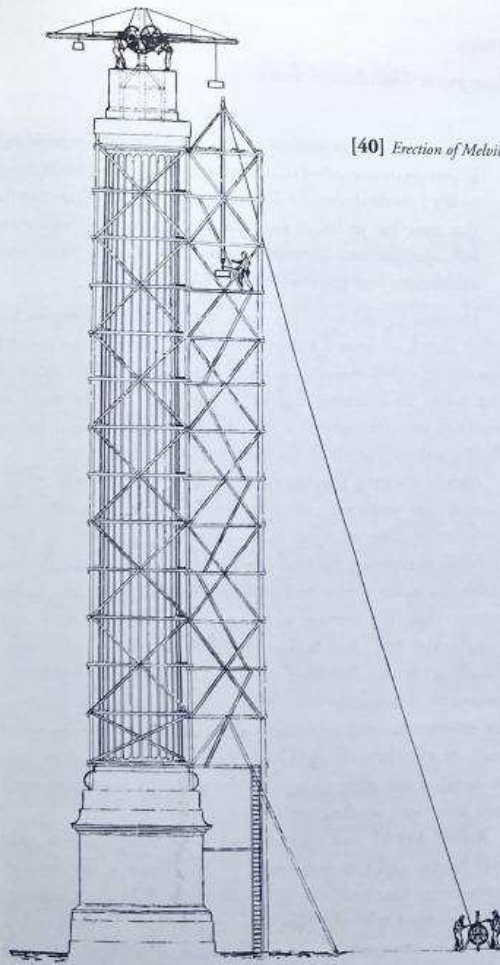
Engineers rarely receive the credit they deserve for their often essential contributions to the structural integrity of notable buildings. It was ever thus. The Melville column, except for the brief mention in David's Life of his father, is almost invariably considered to be the work of architect, William Burn, but let us look at Robert's role. In March 1821, together with Burn, he examined the 31 feet square foundation pit for the column, which was then 8 feet deep, and reported that as the monument was upwards of 140 feet high and weighed about 1,500 tons, it becomes necessary to obtain the best foundation . . . such considerations naturally suggest the unpleasant aspect and even dangerous state of the hanging tower of Pisa, the spire of Salisbury Cathedral and other instances of failure in the foundation of lofty buildings . . . the foundation pit should now be dug to the depth of

*12 feet before any final decision is entered into.*²⁹

By 23 March the foundation pit had been duly excavated to a depth of 12 feet and Robert pronounced it *in all respects sufficient for the support of the building* without timber planking or piling. After specifying the form and method of construction of the masonry from 31 feet square at its base and diminishing by equal scarsements of 5 inches to 22 feet square, he then considered the strength of the walls of the column itself, modifying thicknesses and staircase dimensions. He preferred the use of Craighleith stone as being *not only of a beautiful and durable quality but it is also of a considerably greater specific gravity and strength of grit* than the stone from any other sandstone quarry with which he was acquainted.

Two months later the work below ground level had been executed in accordance with Robert's recommendations. In order to fund these alterations he urged the committee to *extend the funds to £500 or £600 a sum still too inconsiderable to be put in competition with the more certain stability of a building intended to perpetuate the memory of so illustrious a statesman as the late Viscount Melville.*³⁰ The project did go ahead and the scaffolding and tackling for the incredibly delicate task of raising and positioning the statue were carried out under Robert's direction using an iron balance crane of the type used at the Bell Rock, perhaps even the same one. [40]

Robert had a life-long interest in gaining and promoting knowledge and his writings, which were of a descriptive and practical character, appeared in more than sixty publications. Many were engineering reports, but about one-third achieved wider circulation through leading periodicals, encyclopedias and text-books, details of a selection of which, including his ten



[40] Erection of Melville Column, St. Andrew Square, Edinburgh, 1821. Note landing stage for stone transfer.

articles to the *Edinburgh Encyclopedia* and the *Encyclopedia Britannica* have been included in Appendix 1. Many of his publications because of their depth and authority now represent a valuable historical resource to local and engineering historians. It is for these, his memorials in stone at the Bell Rock and throughout Scotland, and his establishment of the Stevenson engineering consultancy and the Scottish lighthouse service that he is now chiefly remembered.

Robert's professional interests are reflected in his membership of numerous learned societies, the earliest known being that of the Highland Society in 1807. By 1812 he was a member of the council of the Wernerian Natural History Society and, in the following year, a founder director of the Astronomical Institution of Edinburgh. In 1815 he was elected to fellowships of the Royal Society of Edinburgh, the Geological Society and the Society of Antiquaries of Scotland.

In 1821 Robert became a founder subscriber to and soon afterwards a director of the School of Arts in Edinburgh, Britain's first Mechanics Institute, from which Heriot-Watt University traces its origin. In 1827 and 1828 he was elected respectively to membership of the Smeatonian Society of Civil Engineers and the Institution of Civil Engineers. These elections, particularly the latter for which he was sponsored by Telford, were a fitting recognition of his acceptance into the first rank of British civil engineers.