

Chapter Seven

David A. Stevenson 1854-1938 - Extender of the coastal lights

Family recollections

David Alan, eldest son of David Stevenson, was born at 8 Forth Street. His younger brother, Charles, arrived less than a year and a half later. Both boys went to Scott's Preparatory School in Picardy Place and then on to Edinburgh Academy. [87] Much of their childhood held shared experiences but it is from Charles that we have an account of the houses they lived in and the times they spent with their first cousin Louis.

In 'Memoirs of Himself', written in San Francisco in 1880, Louis referred to his cousin:

'I learned to read when I was seven, looking over the pictures in illustrated papers while recovering from a gastric fever. It was thus done at a blow; all previous efforts to teach me having been defeated by my active idleness and remarkable inconsequence of mind. The same fever is remarkable to me for another reason; one of my little cousins (D.A.S.) having sent me a letter every day. This was a kindness I shall never forget till the day of my death; though I see little of him now, and cannot think he much affects me, I have an incredible smothered warmth of affection towards him in my heart. As he will probably outlive me, I hope he may see these words and take the thanks I have been always too shy to renew to him in person.'⁶⁴

In 1870 David Stevenson wrote an account of his life and the various works for which he was responsible for the information of his children. This was done at the urgent request of Elizabeth. He had it privately printed and called it *Records of a mother*.

She had caught diphtheria when nursing Charles in 1871. Davie was not at home at the time; he was helping with the

construction of Dhu Heartach. She died on the 7th of July, aged 55, and was a terrible loss, to David and his children. In later years Charles could never speak of his mother to anyone. Possibly he felt guilt of some sort that she had caught this illness while nursing him. David wrote that her last words were a request to him that none of the children were to see her as she was in death as she wanted them to remember her as she had been in life.

In the same year Davie captured the imagination of his uncle Alan:

'In 1861 when I was 7 years old my Uncle Alan presented me with the large picture of the Bell Rock in progress which hangs in our dining room. I don't know how he came to do this as he had a son R. A. M. Stevenson who was 3 or 4 years older than I was who however as it turned out did not become an engineer. The following is a copy of the letter Alan wrote to my father and of the inscription that was pasted on the back of the picture but which when it was cleaned some years ago the stupid people removed it.

Portobello

15th July 1861.

My Dear David,

I enclose a Latin inscription for the back of the picture which you can paste on when you get it. I hope dear D.A. may some day be able to read it and perhaps to point out some unclassicalism therein.

Ever your affectionate brother

Alan Stevenson

David Alano Stevenson

carissimo nepote meo
hanc phari apud tintinnabuli rupen imaginem
(Patro mei carrique sui Roberti Stevensoni
laborum difficilliorum periculossimorum umque digni fructus)
dico imaginem amaris nei erga Davidulum meum patruus
dedi Alanus Stevensonus Portusbelli Idilis quinctil. A.D. 1861

The translation, by himself, reads:

To David Alan Stevenson
my dearest nephew,
this Picture of the Lighthouse on the Bell Rock
(the worthy fruit of the most arduous and perilous labours of
Robert Stevenson my father and his grandfather)
This picture I say I his Uncle have given
as a pledge of my love towards my dear little David.
Alan Stevenson, Portobello, July 1861.⁷⁵

His father took Davie with him in 1868 on board the *Pharos* as she sailed with the Commissioners of Northern Lights on their annual inspection voyage. Here are some extracts from the diary Robert insisted that he should write:

Tuesday 7 [July 1868]

We also shipped at Port St Mary a Manx cat without a tail which on coming on board at once became perfectly intimate with Milo [the ship's dog] who was glad to get him for a companion.

Monday 13 [July 1868]

Then on to Isle Ornsay where we anchored for the night. ... here we put ashore our tailless Manx cat which the captain

did not wish to keep on board. Milo missed it very much. Milo has been getting famous walks ashore. he is an extraordinary animal and if by any chance he be left ashore he waits patiently till he hears them weighing the anchor and then he jumps into the sea to swim to the ship no matter how far off she is.⁷⁶

Davie went again with the *Pharos* in 1869 and 1870. Now aged 16 he makes these shrewd observations:

July 6th Wednesday. We left Edin. at 2 o'clock and arr. in Glasgow at + past 3 and drove to the Greenock station where we got a train at 4 which brought us to Greenock at 5. We went to the Ton Tine Hotel where we took rooms and dined. After dinner we got a waggonette and drove along the esplanade to Gourock where it was once proposed to make a harbour and a fine harbour it would have been if there had been money enough to carry it out. We walked home through the town and along the quays, the former swarmed with shows and drunk people and on enquiry learned that the next 3 days were the fair. From the latter we saw several fine steamers starting, the *Dacian* for New York, the *Wolf* for Belfast and the *Camel* for Derry.⁷⁶

1870 also saw the 'Davids' as Louis called them move again, this time to the fashionable west end and 45 Melville Street. Bessie [Elizabeth] had married Alexander J. Napier, W.S., in 1867. Jane's husband was William Mackintosh, later Lord Kyllachy. [109] They married in 1869.

There is a far from flattering account of the great 19th century scientists written by Davie when recalling his university education:

'In 1869 I left the Academy and in 1870 went to the Edinburgh University and took the degree of B.Sc. in Engineering in April 1875. The Professor's lectures I attended were Kelland mathematics, Crum Brown chemistry, Tait natural philosophy, Geikie geology, Fleeming Jenkin engineering. I had as fellow students Sir John Murray of Challenger expedition fame, principal Ewing, Professor Laing of St Andrews. In Tait's laboratory, which I attended, I saw a good deal of the above, afterwards well known men, while Sir William Thompson, afterwards Lord Kelvin, and Sir James Dewar were frequent visitors of Tait and carrying on experiments there in the laboratory in which we assisted. In this connection I was a regular attender of the evening meetings of the Edinburgh Royal Society and the Society of Arts where we had papers from Kelvin, Tait, Laing and many other well known scientists. The only thing I would say now is that these gentlemen lectured us as if they had arrived at the root of all natural physics, which has proved not to be the case and I am glad that scientific men in similar walks in life today realise not only that what was put forward then, as being the last word, was not so, but that the advances made since are still far from being final.'⁴⁶

Davie was in due course apprenticed to his father and Uncle Thomas. During university vacations, David took him on inspection or business journeys in Scotland and England. After Charles graduated the two young men visited engineering works in the eastern part of the United States of America and Canada during six weeks of a very hot summer, details of which follow later. They followed much the same route as David had taken forty years before. It took them only ten days in the *California*

and the same time back in the *Anchoria*. On their return they took their places in the family firm as full-time assistants and their talent and the result of their careful training was now obvious to others, including their Uncle Thomas.

Six years after his sons had returned from America David had to retire. Fortunately several years earlier the firm had taken on as assistant Alan Brebner (1826-90). He was the son of a mason who had worked on the Bell Rock. A gifted and well-educated man whom, having qualified as a civil engineer in 1878, the family firm had the great foresight to make a salaried partner. His experience and stability were essential during the 1880s. New contracts had to be negotiated to let Brebner and the young men have anything like a reasonable share in the profits and Thomas was quite unable to appreciate that his health was also failing. He was absent for months on end but was very proud to be the head of the firm and he would return at intervals and accomplish a great burst of work before disappearing again to be nursed by his family. With great patience and restraint from Davie and Charles, new contracts were drawn up but only Thomas's death in 1887 gave them and Alan Brebner the chance for a fair financial deal. Louis, as he said, had never paid any attention to these matters and he was angry with Davie when he got a long letter in Bournemouth asking for his help.

'19th April, 1887.

My Dear Louis,

Mr. Dick tells me that he has had some correspondence with you in reference to our office arrangements. He also says that you propose an interview with me on the subject. I am afraid that such an interview would be very painful & not likely to

result in good. As however from your proposing an interview I conclude you are desirous of an interchange of views on the subject & are now acting for your father, I will frankly give you mine, little as I relish the job. From what Mr. Dick tells me I do not think you realise the position. When the present contract was made as perhaps you don't know my father was so ill that he never knew that an arrangement was going on, there was a great deal of discussion, Charlie & I it is needless to say were not satisfied but we were ultimately told, take what is offered or clear out altogether. Against my will but on the advice of friends we agreed to go into the business on the understanding that there should be a revision of the division of profits in 3 years & arbitration if necessary. This time has now come & if Uncle Tom had been well & doing his share of the work up to date this revision would have taken place as between Charlie & myself and we should certainly have been entitled to more favourable terms. But not only has the time for revision come but a very different state of matters has arisen my uncle has not been able to do a hands turn of work for more than 18 months & as this is the case not only are we entitled to still further consideration but Mr. Brebner also has his claim. His view I may say has been from the first that your father should retire on the £500 provided for that purpose in the contract at least till he was able to resume work again. I suppose you have no hope of his ever being able to resume work again & I fear from what Dr. Balfour says there is none. If that is so then the only fair & honest thing to do is for him to retire on his £500.

The ground on which the last contract was drawn so much to our disadvantage was stated to be that my father had drawn more from the business than your father. This was

raised when my father was unable to enlighten us on the subject & we had to fight with our hands tied as we knew nothing about it & had not access to his papers. But since his death I have of course seen his papers & I now know where we are.

In drawing that contract it was ignored that my father was a member of the firm 8 years before your father entered the office & that the business was practically his, his share of the profits the year before your father was taken in was over £2000. Consequently my father as senior partner & managing partner was entitled to a larger share of the profits & I say managing partner advisedly as he did by far the larger share of the work even up to recent times as the books and those who knew the business can testify. If such argument as that is to be used & with much more reason (for he came into the office only 1 year after me & joined the firm only 3 years later) Charlie will come down on me in years to come because I am drawing more than he is at present.

It was further ignored that my father gave up the individual appointments of engineer to the N.L.C. & the Fishery Board & got your father conjoined with him thereby giving up 2 retiring allowances and yet after being only 6 months out of the office he was ejected from the business without a sixpence of retiring allowance whereas a retiring allowance of £500 was secured to your father: & not only so, but in the event of his death, this sum is to be paid to his heirs to the end of the contract!

To come now to the more personal matter, even supposing your father was foolish enough not to get his fair share of the profits during the former contracts, I fail to see why we are to suffer for that. and suffer some we have. Summing the 11

years I worked in the office under the previous contract, for the first 6 I got nothing, & for the last 5 the princely sum of £100 per annum, Charlie was 10 years & never got a sixpence!! During that time our time was charged as assistants, & we worked hard I can tell you. I don't know how it looks to you but if I had been a member of the firm during that time I should be ashamed to treat anyone in such a way. I have already detailed how we were treated when the present contract was being arranged & the figures which Mr. Dick has put I understand before you speak for themselves, & it is needless to say I am not satisfied with the present arrangement.

Now the point is simply this, is my uncle to continue to draw from the business money for which he is not working. During the existence of present contract he has drawn half of the whole profits of the business leaving the other half for division between Brebner, Charlie & myself & has done nothing since August 1885 & was really unfit for business some time before that. An Engineer's business is a personal matter & is not like a grocer's business, & to treat it as a *family possession* is absurd. We derive no benefit from your father's being in the firm unless he were here & able to take up remits made to him (which do not come as he is not here) & the business would then be much more prosperous than it is. The family argument is really too much; you tried engineering & did not like it & took to literature. I stick to Engineering & work at it & as I understand it you think you have a claim on my exertions, are you prepared to share the profits of your work with me?

I think the terms we prepared were extremely liberal an income of £1200 a year for doing nothing for 2 years & at

the end of that time which would be 3 years of idleness surely if still unable for business it would not be too much to ask a man to retire on the £500 provided in the contract for the purpose. I am not so sure now as I was at the time when this proposal was made 4 months ago of getting the matter so satisfactorily settled as it is now only too evident that a rest has done your father no good.

I would only say that if you could send someone like Charles Baxter to talk to Cheyne on your father's behalf (instead of Mowbray who is like a bear) Cheyne says matters might yet be arranged. If not I hope one of the three arbiters we named may be at once selected as time presses & arrangements should be made to have Brebner's claim also settled under it. Now you will perhaps think I have just spoken my mind too openly but I thought it best to let you see the bottom at once & I regret at once if I have pained you in any way but I would remind you of what I endured when the present contract was being drawn.

I hope that you are keeping well & that Mrs. Louis is also well. I have been reading your pessimistic politics with interest. I hear your father is to be home this week which I hope means that he is better.

Yours sincerely,
D. A. Stevenson.⁹⁷

Louis replied by return:
'Skerryvore Bournemouth April 21st. 1887

Dear Davie

It would be impossible for you and me (of all people in the world) to discuss the conduct of our respective fathers; and it was far from that that I ventured to propose. Just this much

I will say since you have referred to it: that to all human affairs there are two sides: I am sure there is something on your side; be you sure, too, there is something on ours.

But what I wish explained, and had hoped we might discuss, was very different.

Mr Dick's last statement was to all of us here a mere amazement. My father, my mother – and seemingly Mr Dick himself, until he restudied the matter, had understood the contract one way; and now we hear it is to be understood in quite another, of which we can no more approve than you would do yourself. That this ambiguity should ever have existed, that it should still exist – for neither Mr Dick nor you have said one word about it – is enough to stop further negotiation. For you must see for yourself that my mother and I can come to no decision as to a contract when we do not know what that contract is; and that it would be absurd to lay a case before arbiters till it has first been laid before the partners. Besides when I perceived the possibility of so great an error on our side, I thought it not improbable there might be some on both sides, & that a meeting might have cleared up all. You think the meeting impossible; doubtless you are right; and yet it is necessary for us to get the facts. I have therefore, so far as I am able, decided to adopt your alternative, and to ask Charles Baxter to see Mr Cheyne upon the matter. I trust he may see his way to act.

I must say one word in conclusion as to what you say of me. I have not put myself forward, except to spare my mother some pains, and to avert if possible a family difference; but you have referred to me so pointedly that I find that I must make at least this much of an answer. I have indeed no claim on the business; I have made none; if I thought I had one, I

should be the last man to advance it. That you may have heard something which sounds the contrary of this, I think possible; nor can I explain that now: the explanation indeed might occur to you yourself; and it is sufficient for me — it is all I am able to do — at present, to set you right as to the fact. I am not quite indifferent to the result; for supposing my father to live, I may have to help him. Outside of that, it touches me not; nor shall that amount of self-interest make me at all ashamed to continue to help my mother in this correspondence. And I am sure of this: that no one who knows me, however slightly, will suppose me to think once of my own pocket.

My father has gone North today; he is very far from being well indeed.

Yours sincerely,
Robert Louis Stevenson.²⁸

Thomas and Louis had both been too ill to come north to attend to matters, and it was Maggie who arrived in Edinburgh as battle raged between the lawyers. When Thomas did go north it was in a private railway carriage taking him home for the last time. Louis could not believe that the firm would be able to carry on at all without his father; however, his cousins' partnership was to last for fifty years. Brebner died suddenly of a stroke in 1890, aged 63, but David and Charles combined their mutual talents and held the business together.

Marriage for Davie was to come three years after Charles. At his wedding he had met one of the bridesmaids called Dorothy Roberts, daughter of William Roberts of Beckenham in Kent, a cousin of Field Marshall Lord Roberts. David and Dorothy were married at St Paul's Church in Beckenham. The honeymoon was

a splendid tour of the continent starting and ending in Paris.

'Among the many presents we received I valued two especially. One was the clock with Neptune on the top presented by nine Inspectors of Works who had all done good work for me at the various lighthouses and harbours I was engaged on and a silver bowl from my co-directors of the Scottish Equitable Insurance Company.'⁵

Davie and Dorothy returned to 45 Melville Street where he had lived with his sisters since his father's death, and they moved out into lodgings. Their first child Dorothy Emily Stevenson was born in November the same year and another daughter Kathleen was to be their last child. They moved to No. 14 Eglinton Crescent.

Davie was a member of the Royal Company of Archers, the Royal Scottish Society of Arts, the Highland and Agricultural Society and the Royal Meteorological Society. In succession to his father he was a Director of the Scottish Equitable Assurance Company for fifty-four years.

He was unlucky that he did not enjoy the excellent health that Charles had all his life. He had to stop work in 1888, only a year after his Uncle Thomas had died, and then again in 1889 and also after his marriage in 1885. He had a wide circle of friends in all walks of life. An extrovert by nature, he was easily depressed and worried when the workload increased. The personal historical notes written by himself show the astounding amount of work he did for the Northern Lighthouse Board but even a supportive wife and family did not save him from what today would be recognised as excessive stress leading to nervous breakdowns. Charles stood firm for his brother and coped with both the lighthouse work and the family firm during his

absences. Both men were outstanding engineers and their combined achievements in that field are as remarkable as anything from their forebears. David worked amicably for over fifty years with his brother.

He was an excellent husband to Dorothy Roberts, and extremely proud of his two daughters.

Dorothy Roberts came from a family superior in social status to the Stevensons. She was an old school friend of Meta's and remained close to her for many years while their children grew up. She probably did not know that Meta was jealous of her in petty ways such as owning her own carriage to make her weekly social calls. [88,89]

Davie died, at his home, Troqueer, in Colinton, in 1938 only a few months after he retired.

A professional aspect

David A. was thoroughly trained in the traditional engineering mould as an entry from his diary for 11 July 1870 for landing stones at Dhu Heartach lighthouse works, when he was 15 years old, amply demonstrates, . . . *if a heavy sea is seen coming round the rock [rope] B is slackened and A is tightened and the lighter glides off from the rock allowing the sea to pass. Whenever the lighter comes alongside the Rock a steam crane on the landing place raises the stone out of the lighter to the rock [sketch 'process of landing' - 90, 62] Another crane lifts the stone on to a truck which running on rails is pulled up to the top of the rock by a steam winch. Another crane lifts the stone on to the top of the lighthouse and the 5th crane places the stone in its place. When we landed the 14th course was being laid.*⁸⁵

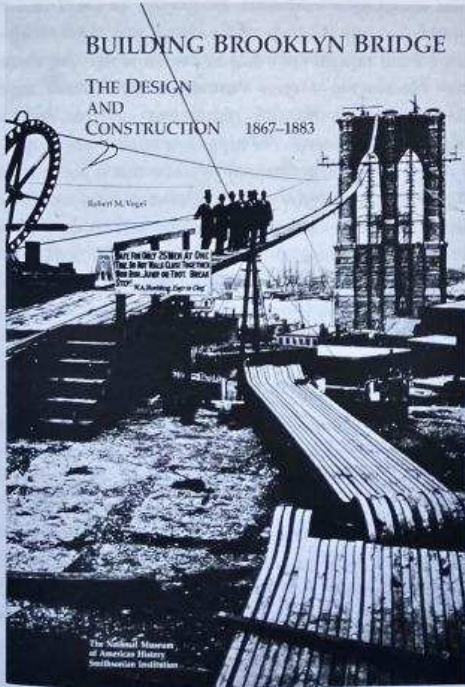
The most authoritative outline of David A.'s career and the firm's work before the first world war is to be found in his

to rock allowing the sea to pass
 raises the stone out of the light
 we lifts the stone on to truck

PROCESS OF LANDING

100 1-1-16 +1-1-16 10

[90] Davie's sketch of landing stones at Dhu Heariach, 1870.



[91] Brooklyn Bridge similar to as seen by Davie and Charles, 1877.

holograph *Personal Historical Notes* covering the period 1871-1914.⁶⁶ In 1875, having got my degree, he wrote, I formally entered the office of my father and uncle Thomas Stevenson as an apprentice. In 1877 I was awarded a Manby Premium of the Institution of Civil Engineers for an account read before them of *Dhu Heariach Lighthouse*. In 1877 [with Charles] I visited the *United States and Canada* for the purpose of studying the principal engineering works of their countries. I went out to New York . . . There I crossed the Hudson [he means the East River] on the temporary gangway of the suspension bridge then building [Brooklyn Bridge - the four feet wide, swaying, lofty, gangway provided for the workmen during stringing of the main cables - 91]. I was accorded a warm welcome from all the engineers to whom I had letters of introduction and made a tour going south first to Boston then to Washington, then to St. Louis, north to Chicago, then east to Niagara, Toronto, Montreal, Quebec, and back to New York and home. When in New York I attended a lecture given by Bell the inventor of the telephone and was greatly interested in hearing a band which he said was playing in Boston. This I could hardly believe at the time was true. On my return home I was engaged in making surveys and plans for harbour works at Port Seton, Boddam, St Monance, Burnmouth and the construction of a small lighthouse on Holy Island [Arran] at the entrance to Lamash harbour.

In 1878 . . . I now became a partner in the firm and had great difficulty in getting reasonable terms. My uncle took into the firm Mr Alan Brebner who had been for many years an assistant in the firm and a very able one, but he declined to take in my brother Charles. There was a long controversy on the subject . . . declined to join the firm unless Charles was also taken in. This was ultimately

agreed to but the terms he got were very meagre . . . The firm was much engaged at this time with the Clyde Lighthouse Trustees Bill for the deepening and improvement of the Clyde from Port Glasgow down to the sea, considerable opposition coming from the Greenock and even the Clyde Trustees the interests of Glasgow and Greenock being somewhat antagonistic. I was also engaged in the construction of a bridge at Hutton^o and with designs for a proposed harbour at Gourrock.

In 1879 I was principally engaged with the Clyde Bill, with improvements on Anstruther harbour and a proposal to erect a lighthouse on the South Carr Rock near Seacliff. The main question whether the light should not be on the Bass instead, this being our view and was ultimately adopted. In 1880 the Clyde Lighthouse Trustees Bill providing for the deepening of the Clyde to 18 feet at low water was passed. I was further engaged in designing and carrying out a scheme for purifying the Dunse Sewerage before it passed into the stream, on harbour works at Burnmouth, Port Seton, Boddam and Findochtie, on reporting for the Board of Supervision on schemes of water supply for a large number of towns. For the Northern Lighthouse service I was engaged on the introduction of the Courtenay Whistling buoy, the survey for a light on Langness in the Isle of Man and an important report on the better lighting of the coasts specially in Orkney and Shetland which I visited for the purpose.

In 1881 the first Pintsch lighted gas buoy was laid down on the Gannet Rock near Inch Keith. I was much engaged with work in connection with a committee on the power of the various sources and apparatus that was in use in lighthouses. Also with meeting a proposal by the French Lighthouses Authority to introduce electric light in all the important lights on their coasts which we considered unnecessary to adopt in this country and as a matter of fact was not

carried out even in France. Considerable damage was caused to several lighthouse stations on the west coast by an exceptionally severe winter gale and the carrying out of the necessary repairs occupied a considerable part of my time. I also was appointed to value the water power of the mills on the North Esk, to form the basis of an assessment to raise money to maintain the North Esk reservoir [in the Pentland Hills near Carlops]. In 1882 the strengthening of the Skervuile lighthouse tower in the Sound of Jura and attending a conference on buoyage at the Trinity House presided over by the Duke of Edinburgh were the most important work I was engaged in. While an exhaustive report on the state of the Haddington Fishery harbours, and harbour works at Lossiemouth, Bruichladich (Islay) and quays at Londonderry occupied my attention. The opposition to the Forth Bridge by the Caledonian Railway Company to secure that it was made such a height as not to interfere with navigation involved some interesting surveying of the tidal currents in the neighbourhood which we carried out with theodolites fixing the position of floats.

In 1883 Mr Joseph Chamberlain, then president of the Board of Trade, was taking a great interest in the discussion that was going on as to whether oil, gas or electricity was the best illuminant for lighthouses. The Trinity House were in favour of oil, the Irish Board of gas and the French of electricity. Our view in Scotland was that it depended on the circumstances which it was best to adopt. He came down to Granton in the Trinity House yacht 'Galatea' and as my uncle [Thomas] was unwell I met him . . . he expressed himself as very desirous that we should . . . give a trial of putting in a powerful electric light and chose ultimately the Isle of May. This was subsequently done. I was engaged during this year with work on the illuminants committee with the construction of the Ailsa Craig light and fog signals and also with the preparation of an important report

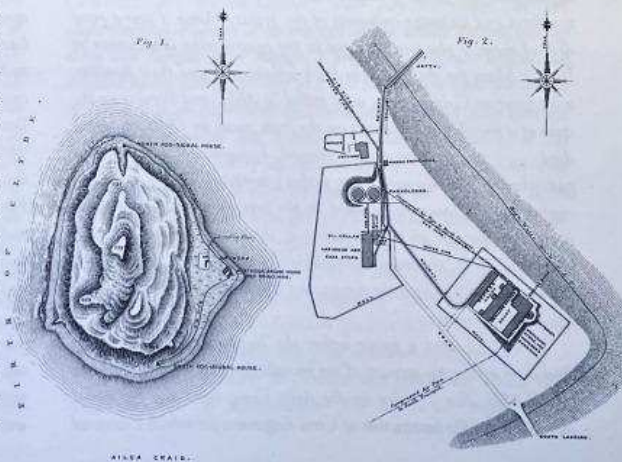
on the necessity of several lights on the coasts of Orkney and Shetland for which purpose I visited and surveyed the several sites proposed.

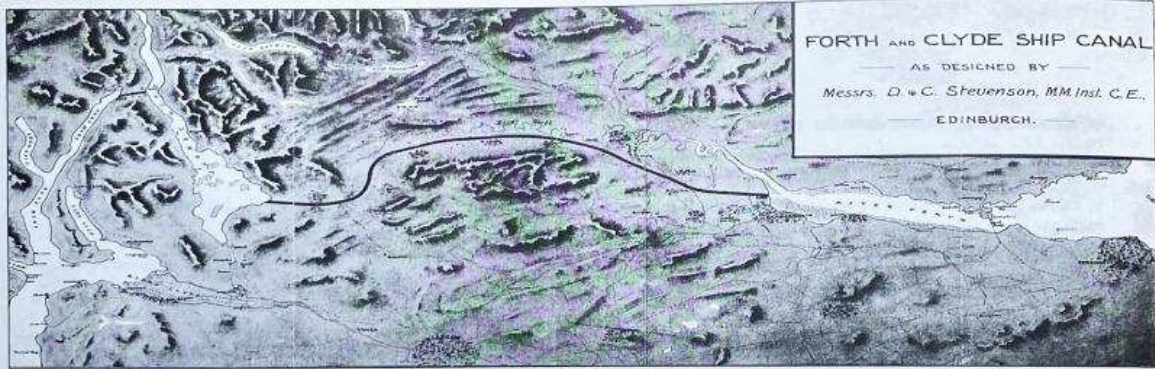
In 1884 I was admitted a member of the Institution of Civil Engineers [A.M.I.C.E., becoming M.I.C.E. in December 1886]. I visited and surveyed Mulroy Bay in the north of Ireland and advised Lord Leitrim on the improvement of the navigation . . . I also was very busy in preparing information for my uncle to give evidence on behalf of the Mersey Harbour Board against the original Manchester Ship Canal scheme. The Bill had been passed the previous year by one committee of Parliament and thrown out by another, and was again put forward this year. We were called in to assist Mr Lyster the Liverpool harbour engineer and there is no doubt that the evidence given by my uncle threw out the Bill. The proposal was to form the canal by river walls constructed in the estuary. Our view was that such walls would result in silting up the estuary and so diminish the amount of tidal water that would flow into it at every tide and thus reduce the scour over and hence the depth of the bar beyond Liverpool, a very serious matter. I made investigations at the Dee, the Nith, the Lune where such effects had resulted and was long in London watching the case and coaching my uncle who was far from well. The Bill was thrown out and next year a scheme was brought forward, that was actually constructed, under which the estuary was not interfered with. It was opposed again but we declined to support the opposition as our objections were removed, and the Bill passed.

In 1885 my uncle being unwell, I was appointed joint Engineer with him to the Commissioners of Northern Lighthouses. Indeed I had for some years been doing most of the work. I was a good deal engaged this year with experiments



[92] Ailsa Craig Lighthouse and foghorn, 1886. Plan from David's prize-winning paper in Min. Proc. I.C.E., 1887.⁹⁹





[93] D. & C. Stevenson's Forth & Clyde Canal plan, c. 1913. Proposed to be level between sea locks, 100ft. wide at bottom and 31ft. deep. Not executed.

carried out at the South Foreland lighthouse by the Trinity House on the power of various forms of illuminants and apparatus for lighthouses. Sir James Douglas and S. Mathews being respectively the chief and assistant engineers of the Trinity House. I saw a good deal of them. I also was engaged in the construction of a station at Port St Mary for the Chickens Rock lightkeepers and their families, a harbour at Coldingham, now called St Abbs, and Reports on the state of a number of harbours on the Irish coast. In 1886 my father died . . . my brother and I revised, brought up to date, and published a 3rd edition of our father's book on 'Canal and river engineering'. I was also engaged in the introduction of the electric light into the Isle of May lighthouse, designing various pieces of apparatus for it, also on the completion of Ailsa Craig light and fog signal station [92] and the design and erection of the Oscar light in the Firth of Forth.

In 1887 I read a paper before the Institution of Mechanical Engineers giving an account of the installation of electric light at the Isle of May. Also a paper on the Ailsa Craig light and fog signal station before the Institution of Civil Engineers for which I received

the Telford premium. In this year also my uncle died and I was appointed sole Engineer to the Commissioners of Northern Lighthouses. I was principally engaged in the design and construction of the North Carr light vessel laid down off Fifeness. It had several novelties including the introduction of steam engines on such vessels for actuating the fog horn. In 1888 I was engaged in the construction of a pier at Broadford [Skye] for the Scottish Fishery Board, also a new outfall for the Water of Leith sewer at Leith. In 1889 we were asked by a committee of Edinburgh gentlemen interested in trade to design a ship canal on the line of the present Forth and Clyde barge canal. We looked into the matter and recommended that a ship canal on that line was not feasible and recommended a route through Loch Lomond into Loch Long. It was approved of but made no progress. [93]

In 1890 Mr Alan Brebner died and my brother and I were left sole partners and altered the name of the firm to D. & C. Stevenson, my uncle having altered it in [1883] to T. & D. Stevenson. In this year the Clyde Lighthouses Trustees got an Act to deepen the Clyde within their jurisdiction to 23 feet at low water. [113] There was

strong opposition but we overcame it, in fact it tailed out and I gave the necessary evidence before the Committee of the House of Lords. I also read a paper before the International Conference on Inland Navigation held at Manchester on our proposed Forth and Clyde ship canal scheme. We also originated and put forward a scheme for a railway from Longniddry to Gullane which in conjunction with Blyth & Cunningham was put forward by the North British Railway Company as a Bill and ultimately was carried out. Beacon lights of a temporary character were also erected on Stroma in the Pentland Firth and Grey Rocks [Glas Eileanan?] in the Sound of Mull.

In 1891 I was principally engaged in designing and carrying out schemes of improvement of the River Lune by river walls and new quays, also in designing an important new lighthouse on Sule Skerry, a low rock 40 miles north of the Butt of Lewis and the same distance from the west coast of Orkney. Also with the erection of beacon lights at Weaver Point, Castle Bay and Culavary [Calvay], all Uist. In 1892 . . . the lighthouses on Fair Isle, one at each end were completed. I was also engaged with constructing oil gas works at Oban for making oil gas for lighting buoys and beacons on the west coast. Beacon lights at Kyle Rhea, Carlouway [North Lewis], Beamer Beacon [Fife], Croulin [Applecross], Risantru [Jura], Dul Sgeir [Kerrera] were also in progress. 1893 . . . the lighthouse on Helliar Holm near Kirkwall was completed. I was much employed in designs for piers to accommodate the lighthouse tenders at Stromness and Oban. Also with a report on the places on the coast that needed lights and fog signals, the intensity of the lights on the coasts and beacon lights at Foula Ness [Shetland], Heston [Kirkcudbrightshire], Dunvegan, Eyre Point.

1894. In this year the important light on Stroma in the

Pentland Firth was begun, trials of the Courtenay Whistling Buoy were carried out, a trial was made of a wireless signalling scheme proposed by my brother for use at remote lighthouse stations, beacon lights at Vaila and Loch Eribol [Sutherland] were proceeded with, a further Report on the lights needed in Orkney and Shetland was prepared . . . Oxcar lighthouse was up to this time lighted with an oil burner and attended by keepers, but to save expense of maintenance I suggested it should be lighted with gas and unattended except at intervals of 2 or 3 months. This scheme was carried out with success. Apart from lighthouse work I was engaged on a scheme for improving the navigation of the Forth up to Stirling and on a pier at Lamlash in Arran.

1895. Rattray head lights and Sule Skerry were completed. [98,99] An attack having been made on the Commissioners, by shipowners who pay the dues, at the Departmental Enquiry as to the cost of the works carried out by them and various other matters I prepared a defence which was adopted by the Commissioners and this was lodged with the Board of Trade. It is an important document and goes very fully into the various points raised and I think is a complete answer to the complaints made. Skerry of Ness [Orkney], Balta Sound and Hillswick beacon lights were erected. Several less important lights were converted to be lit with gas and the keepers withdrawn with the exception of one attendant. Surveys were made for new lighthouses at Noup head in Orkney and Flanan Islands. An important scheme for further deepening the Clyde under the jurisdiction of the Clyde Lighthouses Trustees so as to provide 27 feet at low water up to Glasgow was gone into and reported on.

1896. The lighthouse on Stroma was completed. Oban and Stromness piers to accommodate the lighthouse tenders were

proceeded with. I introduced a motor driven siren and established the first of them at Butt of Lewis and this was found to be a great improvement. I also reported this year on the advantage of reducing the length of the periods of fog signals. A complaint was made of the Mull of Kintyre fog signal not being properly heard and Admiral Nares of the Board of Trade came to investigate the matter. I accompanied him to the station along with Sheriff afterwards Lord Johnston and Sheriff afterwards Lord Dundas. The Admiral was quite satisfied. Experiments were carried out as to the use of acetylene gas for lighthouse purposes and beacon lights were established at Muckle Roe, Scarnish and Nones [Shetland].

1897. Tod Head lighthouse was completed. An unattended lightship was designed and laid down to mark the Otter Rock in the Sound of Jura. Loch Ryan lighthouse was converted to gas. The French lighthouse authorities declared their intention to reduce the length of the flash of light shown by their lights to be one tenth of a second as being quite long enough for full visibility. I was asked to report on this and came to the conclusion that this length of flash was too short and that the flash should not be less than one second, and this is now generally accepted as being necessary. In this year also group flashing buoy lights were proposed, now generally adopted. A report on the necessity for several lighted buoys on the west coast was prepared. On behalf of the Town of Oban I was employed and gave evidence against the proposed extension of their quay in Oban Bay. I objected to the effect the vertical walls they proposed would have on the tranquillity of the anchorage in the bay and succeeded in the company coming under an obligation to make the quay of open timber work with a sloping [battered stone] talus beneath.

1898. Noup head lighthouse was completed and was the first light in the service to have the lens carried on a mercury float, a

system introduced in France. Lighthouses at Trumpan Head in Lewis, Killantringan in Wigtownshire and Barns Ness near Dunbar were begun. Experiments on the use of acetylene gas were continued, Corran [Argyll], Kyle Akin [Skyc], [64] and Oronsay lighthouses were converted to oil gas with only one keeper in charge. Incandescent oil gas burners were introduced.

1899. The lighthouse on Flannan Island was completed. This was a most difficult work. The island lies 15 miles off the west side of Lewis. Although it is 280 feet above high water heavy water passes over it. It is very steep and until we made the concrete step and paths up to it, almost inaccessible. When making the survey we had to take off our boots and clamber up on all fours. It was at this station in [1900] after a severe gale that the three keepers disappeared and were never heard of. The building of Bass Rock lighthouse was begun. This was a difficult work as the foundations had to be incorporated in the ruins [of the castle] and the laying of the air piping for the fog horn from the station over the top to the north side of the island was a troublesome operation. A new and powerful dioptric apparatus of novel design was made for the Bell rock, also an enlarged lantern to hold it. The apparatus was exhibited at the Exhibition being held in Glasgow in 1901 before being erected at the lighthouse. Beacon light were erected at Bunessan, Haxa. Clett Tower and Breascleite [Lewis]. I was asked by the proprietors of fishings on the Teith and Forth to advise them in opposing a Glasgow Bill for taking more water from the tributaries of their rivers without providing any extra compensation. In this year the Advisory Committee of Ship Owners was instituted by the Board of Trade who promised not to sanction any expenditure on new works without bringing it before this committee. This committee has opposed practically every proposal for lights on the Scottish coast.

1900. The erection of the lighthouses at Tiumpan head and Killantringan were completed. Also the new lantern and apparatus for the Bell Rock were proceeded with. The Bass Rock lighthouse was begun. Another Report on the needs of the coast for additional lights was prepared. Surveys were made for a light on Hyskeir and additional beacon lights in Shetland, further experiments on the use of acetylene gas were carried out, the use of carbon tipped burners for beacons introduced and the subject of intensities of lighthouse apparatus further dealt with.

In 1901 Barns ness lighthouse was begun. Acetylene lighted gas beacons were established for the first time. An important trial of the effectiveness of the various forms of fog signal were carried out at St Catherines by the Trinity House and the siren signal sent by the Northern Lighthouse Board proved its superiority. I attended the trials, but in many respects they were badly arranged and the results in several instances were therefore inconclusive as I pointed out in a Report to the Commissioners. Unattended beacon lights were established at Haxa, Clett Tower in Orkney, Bunessan, Breaslete and the Black memorial light on the west coast and the Otter unattended light vessel of the south end of Islay. In 1902 the Bass Rock [lighthouse 94] was completed, as also Barns ness and in consequence of the claims made by the contractor in the latter case a lawsuit became necessary. I gave evidence on the subject and won our case on all points . . .

In 1903 the town council of Oban asked us to report on the best means of dealing with the sewage of Oban which was run into the bay from numerous small sewers and made the state of the foreshore at low water a nuisance. I after careful consideration designed a scheme of carrying out the whole of the sewage along the spit . . . that runs out into the Bay. The scheme was bitterly opposed by

several large proprietors and an Enquiry had to be held before the Sheriff. The scheme was sanctioned however and when carried out has proved a great success. It was a work of considerable difficulty the sewage being collected in a main drain that was run along the front streets of the town at a level just above that of high water . . .

In this year [1903] Sir John Jackson the contractor was induced to take an interest in our Forth and Clyde ship canal scheme and in conjunction with [name missing] and the Duke of Sutherland found the necessary money to make a complete survey of the ground from end to end and prepare parliamentary plans with a view to going for an Act of Parliament to carry out the work. This of course involved a great deal of work. The plans were completed and ready for deposit but at the last moment it was decided to delay proceeding with the Bill in the meantime. The principal reason for this delay was that the large sum that had to be deposited on a bill involving an expenditure of £20,000,000 and had to lie in the hands of the government till the Bill is disposed of, without interest. Lloyds wished to establish stations for signalling to passing vessels at Dunnet head, Cape Wrath, St Abb's head and Butt of Lewis and they came to us to design and carry out the work of establishing them. They each involved the provision of offices and accommodation for 4 families and owing to the remote positions were works of considerable difficulty, but were successfully carried out. In this year I introduced the use of incandescent oil burners. I adopted that known as the Chance burner and it was gradually introduced at all the lighthouse stations in the service, greatly increasing the power of the lights. Additional beacon lights were established at Lady Isle, Sgur Buidhe and Isles of the Sea.

1904. Hyskeir lighthouse was completed and beacon lights established at Barra Head, Mull of Eomick, Symbister, Southerness,

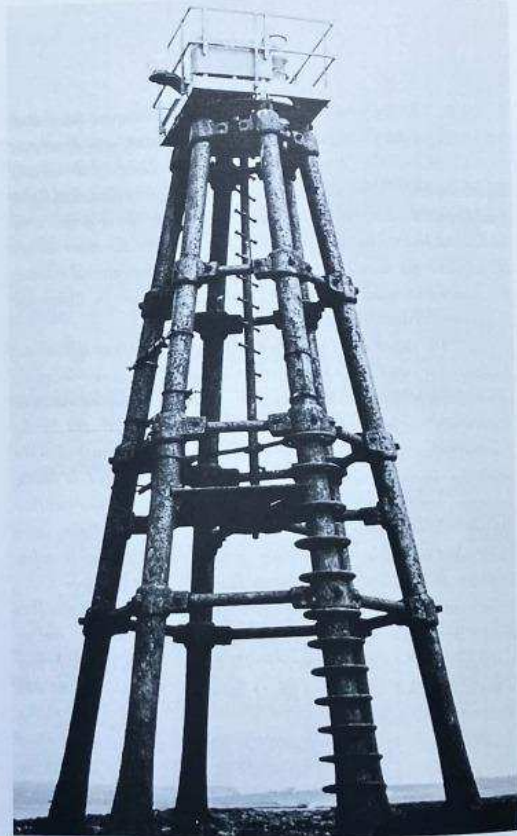
Whitehills and Craigton. I introduced a fusible plug to prevent the oil burners in unattended lights from getting too hot and causing fires of which there had been one or two cases. At this time I saw some prospect of being able to use wireless as a fog signal which I had for a long time considered might be attained. With this view I had been in communication with the Marconi Company without result so far . . .

1905. Holy Island Lighthouse was completed and unattended beacons established at Dul Sgeir, Cath Sgeir [Gigha], Roseness [Orkney], & Arnish.

1906. In this year I appeared before the Royal Commission on Canals and gave evidence in support of our Forth and Clyde ship canal scheme. Beacon lights were established at Swana, Eigg, Green Island, Rhuad Sgeir, an unattended lightship of large size and with a powerful light laid down at Sker. [?], a dangerous rock in the Minch, as also a boat lightship at the Whitestone Bank in the Isle of Man. [Also, Group flashing lights installed at Mull of Kintyre Lighthouse. 95,96]

1907. A trial of the Diaphone fog signal was made at Inch Keith but it was not found to be better than the powerful sirens we had in use. Beacon lights were established at Swana, Milmore [Campbelltown], Lachy Rock, Canna and Churin.

1908. A Royal Commission on Lighthouses sat this year and I was much engaged in preparing to give evidence before it which I did. Mr Gerald Balfour was the chairman and the result was favourable to the way in which the work of the Northern Lighthouse Board was conducted in all departments. Beacon lights were erected at Elieness, Cairns of Coll, Trodday. I was also engaged in an investigation of the river that runs into Loch Ailort in connection with fishing rights. In fixing the boundaries of fishing at Carnoustie, in a remit from the Court of Session with reference to



[97] Lothian beacon, 1910. A standardised design, note the similarity with Coveasa Skerries beacon, 1844. [46]

near from the Edinburgh Gas Works polluting a brewery well at the foot of the Calton Hill and with an important and interesting case between the town of Aberdeen and the Forbes family as to the true position of the Mouth of the Don. I was successful before the courts of proving the contention of the Aberdeen Town Council being the correct view.

1909. Neist Point light was completed, and beacon lights established at Calf of Eday, Firths Voe, Sound of Ness and Riff Reef. I again appeared before the Royal Commission on Canals and gave evidence in support of the Forth and Clyde ship canal. And the committee's finding was that our scheme for the canal was the best and the only one the government would assist which was satisfactory as far as it went. I also was asked to appear before the committee of Imperial Defence as also was Sir John Jackson which we did in support of the canal scheme.

1910. Beacon lights were erected at Lother Rock [Pentland Skerries - 97] and Sandaig. We were consulted by the authorities of Guernsey as to providing a fog signal for the entrance to that harbour. We designed a scheme which was unique and which when carried out was a great success. We installed on the shore electric plant [at Doyle Fort], we carried out to a tower erected on the [Platte Fougère, near the entrance to St. Peter Port] rock a [1 mile long submarine] cable to carry the power to work the air compressors and siren fog horn and the light and also fog signal machinery ashore that could be brought into use in case anything happened to the signal on the rock, it being unattended. [This ingenious and novel sea-mark was designed by Charles] I carried out some experiments at Inch Keith and using a rod for submarine fog signalling. The principle was to lay a rod from the shore out into deep water and to hammer the end on shore with the view of making it ring like a bell and the sound would then travel in water

to considerable distances. As sound travels better in water than air this promised to be a good thing and would take the place of the submarine bell fog signal which could not be used efficiently off headlands, though very satisfactory on lightships. The results were fairly satisfactory but have not been introduced in practice. I was also engaged in opposing the order for the bringing water to East Lothian from [name missing] on behalf of the Mills on the Tyne, as it was not prepared to give a proper amount of compensation water to the Mills. This however I succeeded in securing. James Fleming was the Commissioner. Macmillan was counsel for the promoters and our counsel was Robert Home who afterwards was Chancellor of the Exchequer.

1911. At this time I was engaged in advocating the quick starting of fog signals immediately on the appearance of fog. I was also engaged in sending out the machinery for an up-to-date fog signal to China . . . Also a boat shelter for Lossiemouth, the introduction of wireless control to turn on an acetylene gun fog signal on Roseneath patch on the Clyde of the appearance of fog. I was also engaged on an Enquiry as to the effect of works proposed by the Railway Company off Bo'ness harbour on the effect on the foreshore and other harbours in the neighbourhood.

1912. The lighthouse on Rhuad Rhea [Ross & Cromarty] was completed. An acetylene fog gun was established at Dhu Heartach lighthouse and an unattended beacon erected at Milaid [Lewis]. I was engaged with plans for still further deepening the Clyde from Port Glasgow to Greenock, the proposal being to make the channel 27 feet deep at low water. I was also asked by the Manchester Ship Canal Company to advise them as to the effect of works the Mersey Docks & Harbour Board were proposing to carry out near the bar, and in company with a committee of other three engineers reported on the subject.

1913. I was engaged in enlarging the buoy and other lighthouse stores at Granton. Also with designing a plan for erecting a lighthouse on the outmost reef at Cape Wrath to take the place of the old light which was too high and frequently obscured by fog. This involved some new features in lighthouse construction, the sinking of a vertical shaft down to the level of the reef with a lift in it, the construction of a covered way over the reef, the construction of 2 bridges, and the erection of a tower and fog horn house on the extreme end of the reef. The work was begun, but the contractor deserted the work, and on account of the Great War coming on it was found impossible to get a contractor to finish the work nor to carry it on by days wages. It is still (1927) uncompleted.

1914. Maughold head lighthouse in the Isle of Man was completed and an unattended beacon was erected on Mackintosh Rock near Rosyth. [ends, written in 1927]⁴⁶

Much of the foregoing also relates to Charles's work. David A. was at pains to point out to the Commissioners of the Northern Lighthouse Board that his reports to them were *drawn up jointly by my brother and myself*. An indication of the division of their responsibility is given in D. Alan's unpublished notes, *Except where clients asked for him David restricted his horizon to the Northern Lighthouse Service while Charles dealt with the other work, but all matters were debated between them before reporting. David should perhaps have been a lawyer as were most of his friends, or, as he had a command of words and wrote well, he could have become an author New ideas came from Charles, called forth by the needs of the occasion. His views were basic and convincing in their simplicity and reasonableness. His writing ability was not so good as his brother's, his paragraphs tended to length and his sentences fitted together like a puzzle; dissection*

*destroyed the natural sequence of his reasoning. Adjustment and polishing of Charles's reports was one direction in which David proved the benefit of their partnership.*⁴⁹ This combination of talents and David A.'s evident management ability, somewhat similar to that which existed between his father and Thomas a generation earlier, worked well and ensured the success of the firm until its dissolution in 1936.

For the Board, David A., with the assistance of Charles, was responsible for the design and construction of 24 lighthouses, 48 fog-signals, 5 light-ships, 75 minor lights and many beacons and buoys. Of these lighthouses, according to J. D. Gardner, Engineer to the Board from 1946-55, Sule Skerry [98] - Britain's remotest lighthouse 45 miles north-west of Dunnet Head, Flannan Islands, Bass Rock, and Oigh Sgeir were works of particular difficulty *requiring the exercise of sound judgement and engineering skill.*⁵⁰ To these can be added Rattray Head [99], which was novel in that the lower part of the tower contained an engine room and foghorn. It was the first first-class siren to be installed in a rock lighthouse.

During David A.'s period of office with the Board the brightness of lights increased greatly. In 1875 the most powerful light on the Scottish coast was 44,500 candle-power. By 1901 there were several lights over 100,000 candle-power and the Isle of May electric light of 3,000,000 candle-power. This increase in power was achieved by long focal distance apparatus designed by David A. and Charles and the introduction of Charles's equiangular prisms.

Although only five lighthouses were constructed by the Northern Lighthouse Board after 1914, during David A.'s last 24 years in office, the firm kept very busy not only modernising

the Board's by now very substantial amount of equipment, but also on its general business of river improvement, harbour, sewerage and water supply work.

In addition to the Board's work David A. and Charles acted jointly as Engineers to the Clyde Lighthouses Trust and the Fishery Board and as consulting engineers to several colonial and foreign lighthouse authorities. Notable work included successive deepening of the Clyde from 18 to 30 feet west of Port Glasgow for the Clyde Lighthouses Trust, and the £20m. Forth & Clyde Ship Canal project, more or less on the proposed, but not adopted, northern line recommended by Smeaton in 1764. This canal project, which was undoubtedly feasible, but for which funding was not forthcoming, formed the subject of at least three of David A.'s characteristically well-written publications. He was elected a Fellow of the Royal Society of Edinburgh in 1884 and served on its Council from 1928-31.

When David A. retired from his Northern Lighthouse Board post on 31 March 1938 at the advanced age of 83, after a remarkable 52 years in service as their Engineer, the Board recorded its appreciation of his *invaluable services*. The Corporation of Trinity House, London also wrote expressing thanks *for his ready help and co-operation in solving the many lighthouse problems which had arisen in his day and congratulated him on the advances he made and helped to make in lighthouse techniques.*²¹ These advances undoubtedly included his advocacy of economic illuminants and the successful introduction in 1903 of Chance's incandescent oil burners which were subsequently adopted universally. David A. is remembered today as an effective and outstanding engineer. With his retirement the Board severed its 130-year connection with the Stevenson engineers and appointed John Oswald (d. 1946) as Engineer.