

Robert Davidson – pioneer electrician

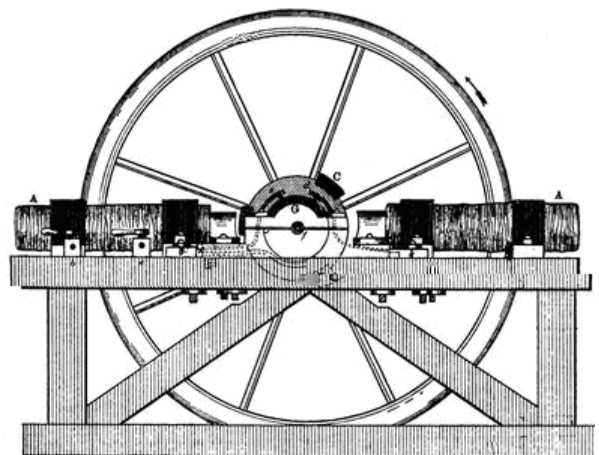
Robert Davidson (1804-1894) was a man of eclectic interests, an inventor who had originality, vision and even prototype devices but did not have the financial or commercial resource to develop his ideas far enough to better the technology of the day. His impact was not in generating a world-beating product or even gaining any significant personal wealth from his inventions but rather in providing an example to his successors of what could be done.



Davidson was born, schooled, spent much of his working life and died in Aberdeen. He attended the second and third year classes of Marischal College from 1819-1821, including the lecture course of Patrick Copland. Since in due course Davidson established himself as a manufacturer and supplier of chemicals, it is likely that he also attended the optional chemistry class at the College given by William Henderson.

Davidson set himself up in business in the 1820s supplying yeast from premises at Causewayend and then in nearby Canal Road, close to the Aberdeen-Inverurie canal. Via a small, narrow, wooden slatted bridge (the 'tarry briggie'), Canal Road today crosses the railway line that follows the old canal cutting. In Davidson's younger days the area was edge-of-town market garden and nursery land that was gradually attracting houses and industry¹. Davidson moved from yeast into chemical manufacturing and supplying, and diverse ventures such as file sharpening. He seems, though, to have had two passions: astronomy and electricity. In astronomy he built himself a large reflecting telescope of 35 feet length with a 2 foot diameter mirror that rivalled the largest productions of John Ramage. His telescope, with its big supporting structure of struts and ladders, must have been a landmark in the area for several years but no illustration of it has been found. What brings Robert Davidson into these notes is his electrical developments.

In the 1830's, Faraday showed how to generate mechanical motion from electricity, albeit in a way that was useless for exploitation as a practical electric motor. Davidson became fascinated by the possibilities. He constructed his own batteries, not a difficult task for a chemical supplier and man with workshop skills, and by 1837 had made his first fair sized electric motor. In 1840 he held a public "Electromagnetic Exhibition" in Aberdeen and thousands paid 1/- entrance to see a working model electric locomotive able to carry two people, a model electric lathe, a small electric printing press and an electro-magnet that could lift 2 tons when supplied by a suitable battery. The motor driving the lathe and printing press had a 5 foot diameter flywheel and the electromagnet had pole pieces 4 inches square. These were not desk-top toys. If Davidson



had had this exhibition in 1880, many would have marvelled. This was 1840, truly well ‘ahead of his time’. The *Aberdeen Banner* prophesied that electromagnetic machinery “*will in no distant date supplant steam*”. Davidson took his exhibition to Edinburgh in the following year, where the influential Robert Chambers of encyclopaedia fame made similar remarks and the young James Clerk Maxwell aged 10 was taken by his father to see it. In late 1842, Davidson took his exhibition to London in the hope of attracting sponsorship. By then he had added an electrically powered circular saw that cut 1” square planks in about 1 second and a powerful electric arc made by passing the current through two pieces of coke. He broke even in London but didn’t attract the sponsorship he’d hoped for. His motor was illustrated (above) in an edition of *Penny’s Mechanic* of 1843.

Between the Aberdeen and London exhibitions, Davidson built a full-sized prototype electric locomotive called *Galvani*. It was 16 feet long and weighed about 6 tons. In 1842 it ran at 4 miles per hour on the Glasgow to Edinburgh line (the railways hadn’t reached Aberdeen by then). Unfortunately, *Galvani* was destroyed before Davidson could get it back, by men unknown but suspected of being promoters of steam engines. In truth, Davidson didn’t quite have the necessary technology to make a commercial success of electric railways. His power was provided by chemical batteries that were expensive to produce and to re-charge them the chemicals had to be replaced. The re-chargeable lead-acid accumulator wasn’t invented until the end of the 1850s. He was some three decades before even the early days of viable electrical generators that could really make electric transport feasible. It all could have happened much earlier if Davidson had found a patron with deep pockets and patience but no-one was forthcoming in the early 1840s.



Electric locomotives would make city underground railways a possibility but they didn’t appear in Britain until around 1890. Robert Davison was suddenly found to be still alive and was converted into a media celebrity “*Octogenarian Aberdonian - oldest living electrician*” the press trumpeted, or words to that effect. *The Electrician* magazine reported “*Robert Davidson was undoubtedly the first to demonstrate the possibility of electrical traction in a practical way*”. He was, but the torch he lit did not begin a blaze. Davidson died 4 years later at the age of 90, old enough to see his vision made real at last.

Nothing remains in Canal Road of Davidson’s house at no. 32 or his business; only the name and the little road with its tarry briggie, itself a ‘modernisation’ of 1854 that replaced a lower bridge over the canal a little downstream. Davidson is buried in St Peter’s cemetery but his gravestone simply describes him as ‘chemist’.

John S. Reid

¹ Diane Morgan “*The Villages of Aberdeen: Round About Mounthooly*”, Denburn Books, Aberdeen (1995), outlines how the area has changed over the last two centuries and includes a short chapter on Davidson.