

John Loudon McAdam, King Of The Roads

By James Gracie

Every time you jump into an automobile and drive somewhere you have at least two Scotsmen — and Ayrshiremen at that — to thank for it. One is John Boyd Dunlop who invented the pneumatic tire. The other is John Loudon McAdam who invented the modern road.

It may seem strange that someone had to “invent” roads. After all, they had existed for centuries, with the Romans being adept at building them. But you would be wrong. Roman roads were not roads in the accepted sense. They were pathways for people — usually soldiers — to march along. And in major towns and cities, roadways were invariably cobbled, poorly made and uncomfortable. Country roads were the responsibility of the parishes through which they passed, and their state was determined by the prosperity of these parishes.

They were built in a layered fashion, the bottom layer consisting of large stones, the second layer consisting of smaller stones and the top layer consisting of smaller stones still. The specification for this top layer was that the stones must be small enough to fit in a man's mouth, and the story goes that each road gang had a man with an exceptionally big mouth as part of the team.

McAdam's roads were different. He retained the multi-layered structure, but in a much more scientific way. All the stones previously used had been gathered from river beds and fields and had been worn until they

were smooth and round. McAdam saw that this didn't provide rigidity and that the smaller layers usually washed away during heavy rainfall. So he introduced crushed stones instead. With their jagged edges, these stones locked together, providing a surface that could withstand heavy traffic.

They also aided drainage. He had discovered that it wasn't rain that

need for a camber (curving upward in the middle) and the surface would last longer. Stones would no longer fall to the side of the road and be lost.

Roads constructed in this manner were found to be safe, comfortable and reliable. Not only that, the roads were better sprung. The large stones on the bottom layer didn't sink into the ground or slide about and the upper layers, because the movement of the individual chips were restricted, “bounced back” into position as soon as a vehicle passed over them. And although the initial costs were higher than before (the stones now had to be broken by hand), maintenance costs were a fraction of what they once had been. Eventually this method spread throughout the world.

John Loudon McAdam was born in what is nowadays called Lady Cathcart's House in the Sandgate in Ayr on September 21, 1756, the youngest of ten children and eventually the only surviving male. His father was James McAdam of Waterhead, just over the border in Dumfriesshire, and his mother was Susanna Cochrane, niece of the 7th Earl of Dundonald whose family seat was a few miles north. His family was therefore well connected — the

Cochranes were said to be descended from Robert III, King of Scots.

In 1760 the family moved to a new house at Lagwyne on James Loudon McAdam's Waterhead estate near Carsphairn. But their residency was short-lived because the house burned down when James and Susanna were in Edinburgh. It is said young John



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caused most of the damage to road surfaces — it was water from below seeping up by capillary action. So he stopped using mud or soil as a binding agent because that encouraged this seepage.

But he went a stage further — he saw that if rough stones were used, improving drainage, there was less



At Muirkirk a stone cairn was erected in 1931 which marks the site of McAdam's tar kilns.

only escaped death by being rescued by his nurse.

So once again the family moved — this time back into Ayrshire. Blairquhan Castle stood near the picturesque village of Straiton, and James leased it from Sir John Whiteford who also owned Ballochmyle near Mauchline. No attempt was made to rebuild Lagwyne because James, as ever, was desperately short of money.

Then James died and was buried in the kirkyard of St. Cuthbert's Church in Straiton. He had been living well beyond his means for many years and the family found they were in serious debt. The last straw came when the Douglas Heron Bank of Ayr collapsed in 1772 (see *The Highlander*, March/April 2002). James had been a major shareholder and since there was no "limited liability" in those days, some of the bank's debts fell on the shareholders and their heirs. The family estate at Lagwyne had to be sold to raise money to pay the debts.

Young John had been attending

school in the nearby town of Maybole while staying at Blairquhan. But now his schooldays had to come to an end. He was the 14-year-old son of a



The cairn's commemorative plaque.

minor member of the nobility with no prospects, no money and no one to turn to for help. Consequently the only opening for him was in trade, and he was packed off to New York to

work for his uncle, William McAdam, a prosperous merchant who owned McAdam and Company which imported goods from Scotland.

Here John worked in the counting house — what we today would call the "finance department." His uncle was a respected member of the New York community and had married Ann Dey, daughter of a prominent New Yorker. So highly thought of was he that in 1771 he was given 30,000 acres of land in Middlesex — now in New Jersey — by Governor Dunmore. This was known as the "Kilby Grant."

Eventually John also became a merchant and had a thriving business with links as far north as Boston and as far south as Charleston. He married Gloriana Nicoll of Suffolk, Long Island, daughter of William Nicoll, and they became owners of land around Shelter Island and Blue Point.

John was therefore happy and reasonably well off. But all that was to change with the coming of the

Continued on page 12

John Loudon McAdam

continued from page 11

American Revolution. Most of the McAdams in New York took the Royalist side and John himself served in the British reserve troops. He was also one of the men who oversaw the selling of booty and land won from revolutionaries.

Consequently, after the Revolution finished, he became a very unpopular man. All his land was confiscated and he headed back to Scotland with his wife and two children in 1783. He must have left with some money, however, because he was able to buy the estate of Sauchrie near Maybole.

It was around this time that he began to take an interest in road building. His first experiments were carried out on what is now the A713 north of Carsphairn, but his first permanent roadway was one leading from the Alloway/Maybole road to his estate. He became Deputy Lord Lieutenant (i.e., the monarch's deputy representative) for Ayrshire, and in 1787 was appointed as a Road Trustee for the county.

But his experiments in road building did not include a tar surface, even though a road surfaced by this material eventually became known as a "tarmacadam" road. Nor did he see the potential when he became interested in a business run by Archibald, the ninth earl of Dundonald, and his son, Thomas, who became an admiral in the navy and served against the Americans in the war of 1812–1815.

This was an iron works based in Muirkirk, an Ayrshire village high on the moors. Associated with it was a works that manufactured tar-based products from locally mined coal. Its main use was in caulking and sealing the timbers on wooden ships.

In 1794 he was commissioned by George III as a major in a corps of artillery, raised in response to the threat posed by the French Revolution. And 1798 he was appointed the revictualling officer for ships at Britain's

western ports during the Napoleonic Wars. It was an onerous task and meant that he had to move south to the great port of Falmouth in Cornwall.

But by 1801 he was in Bristol doing work that was more to his liking. He had accepted the post of surveyor of roads with various trustee bodies overseeing the turnpike roads. He had been amazed that the roads in England were every bit as bad as they were in Scotland and he set about constructing new ones to his own specification (as far as money would allow). By 1818 when he was 62



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years old, he was a consultant to no fewer than 34 turnpike trust bodies.

So highly regarded was he that a committee of the British parliament gave him unstinting praise in a published report. His three sons had by now moved south to help him with his work, and by 1823 he was a consultant to 70 road trusts.

He had the foresight to take out patents on his road building methods, although the government for all its praise saw fit to ignore them when building new roads elsewhere. It maintained that other people had thought of the system at the same time as he had and that he had made

enough money out of his job in Bristol. And by now other countries were starting to use his methods — for which he was paid nothing.

Eventually Parliament granted him £2,000, which wasn't enough for all the work he had put in to perfecting his system. He had, however, become famous and the word "macadamizing" soon entered the English vocabulary, although it had nothing to do with roads — it meant "paving the way" for something to happen.

In 1790, McAdam had leased the farm of Dumcrieff near Moffat in Dumfriesshire and he returned there for a few weeks every year. It was during a visit there in 1836 that he died at age 80. He now lies buried in Moffat kirkyard beside his second wife, Anne Charlotte Delancey.

Nowadays the basic principles of McAdam's road building method still hold true, although reinforced concrete has also become an indispensable building material. Tar is used to bind the smaller layers of stones together and provide a waterproof seal on top. At first the same kind of tar as was produced in his Muirkirk tar works was used, but this was found to be uneconomical and oil-based asphalt from Trinidad and huge refineries was soon used instead.

At Muirkirk a stone cairn was erected in 1931 which marks the site of his tar kilns, with the stones coming from the actual ruins of the kiln buildings. The Blairquhan Castle that John knew has also gone, replaced in the 1820s by a building which looks more like a stately home than a castle. It is sometimes open to the public. And the quiet town of Moffat which nestles in the Dumfriesshire hills has been by-passed by a busy multi-lane freeway which owes much to the methods he invented all these years ago.

