

# Scots' inventions are fuel for independence debate

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A man talking on a phone walks past images of Scots inventor Alexander Graham Bell and Scots doctor Marie Stopes outside the National Library of Scotland in Edinburgh, Scotland, Tuesday, Sept. 16, 2014. The land that gave the world haggis and tartan has produced so much more, from golf and television to Dolly the Sheep and "Grand Theft Auto." If Scotland splits from Britain after a referendum this week, it can stake a claim to inventions that transformed modern life, from surgical anesthetic and penicillin to television, the telephone and even the flush toilet. (AP Photo/Matt Dunham)

What has Scotland ever done for us? Plenty, it turns out. The land that gave the world haggis and tartan has produced so much more, from golf and television to Dolly the Sheep and "Grand Theft Auto."

If Scotland splits from Britain after a referendum this week, it can stake a claim to inventions that transformed modern life, from surgical anesthetic and penicillin to TV, the telephone and even the flush toilet.

No wonder pro-independence First Minister Alex Salmond has approvingly quoted the title of a book by American historian Arthur Herman: "How the Scots Invented the Modern World."

But, experts caution, scientific discovery and invention are rarely solo acts.

"Talking about Scottish inventions as such can be quite difficult," said Maria Castrillo, a curator at the National Library of Scotland who helped create a recent exhibition on Scottish innovations. "A lot of these inventions were the result of collaboration with other people."

Still, the list of achievements is impressive for a country that today has a population of just over 5 million.

There are medical advances such as chloroform anesthetic—pioneered by 19th-century Scottish doctor James Young Simpson—the hypodermic needles created by physician Alexander Wood, and penicillin, discovered by another Scot, Alexander Fleming, while he was working at a London hospital.

Industrial inventions include the steam engine—an age-old idea developed by Scotsman James Watt into an efficient machine that helped spark the Industrial Revolution.

The telephone, patented by Alexander Graham Bell, and John Logie Baird's television transformed communications. Scots can also lay claim to the copy machine. An early version was invented by Watt, the steam-engine pioneer, and used by customers including Benjamin Franklin and Thomas Jefferson.

A 19th-century Scottish bookseller, James Chalmers, has a strong claim to being the inventor of adhesive postage stamps. And it was a Scottish watchmaker, Alexander Cumming, who patented the first flushing toilet.

Scots can also lay claim to the bicycle—or at least the pedals, added by blacksmith Kirkpatrick Macmillan in the 1830s—and even the road to ride it on. The common surfacing material Tarmac, short for tarmacadam, was developed by a Scot.

The inventions are evidence of a rich intellectual and scientific culture spawned by the 18th-century "Scottish Enlightenment," which produced the formative capitalist ideas of Adam Smith. (Savings banks, overdrafts and cash-dispensing machines—also Scottish innovations).

England—Scotland's bigger neighbor and mostly friendly rival—can also claim a rich history of invention that includes the seed drill, the sewing machine, the typewriter, pencils, the sports soccer and cricket and even, arguably, the World Wide Web.

Inevitably, Scottish ingenuity has been seized on by both sides in the independence debate.

Salmond likes to remind people that Scotland is "the land of Adam Smith," even as he hammers London's politicians and its financial district as a drain on Scottish coffers.

He argues that Scotland's entrepreneurial spirit and creativity will stand

it in good stead when it becomes independent.

Some academics sound a note of caution. They worry that researchers in an independent Scotland could be cut off from U.K. funding and partnerships with researchers at other British universities.

Castrillo points out that many of Scotland's great innovations came after it united with England in 1707, opening up opportunities for Scottish scientists and manufacturers.

Nobel Prize-winning geneticist Paul Nurse has argued that "by co-operating together ... we achieve far more than we can ever achieve on our own."

Others say independence will give Scotland the chance to set its own research priorities.

The National Library exhibition included developments as recent as Dolly the Sheep, the world's first cloned mammal—born at Edinburgh's Roslin Institute in 1996—and the work of Rockstar North, the Edinburgh company behind the "Grand Theft Auto" video games.

Whatever happens in Thursday's referendum, the flow of ideas and inventions is unlikely to stop.

"Scotland is punching above its weight—no one is denying that," said Castrillo.

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