1

Genesis of an empire

'We look to Scotland for all our ideas of civilisation'
— Voltaire

The Scottish Empire is, of course, illusory but the giants who spread their influence across the globe offer tangible evidence that, had they had the mind to make it so, the saltire of St Andrew or the more flamboyant lion rampant might have flown across much of the civilised world and the atlases could have had a very different hue.

This, however, is not an empire of colonisation that diminishes or enslaves those whom it embraces. It involves neither the greed nor the ruthlessness so often inherent in empire-building. It is without condescension: an empire that breaks down barriers rather than creating ownership and, it can be claimed, enhances civilisation. Where would you plant the flag to claim sovereignty of ideas and philosophies?

This is not a recital of the adventures of conquering heroes, although some are included. The empire I have in mind is more an outreach of ideas, the story of human endeavour in its many forms, pushing at the boundaries of the imagination and stretching the accepted order. It sweeps from the foothills of press freedom to the high plains of moral philosophy; from the oceans of ingenuity to the great rivers of physical courage; from the borderlands where determination meets initiative to the mighty mountain ranges of originality. It encompasses everything from the spirit of pioneering to the mystical qualities of leadership. It's luckily not dependent on a seat of power and nor is it affected by the bruising arguments about Scotland's place within the UK or as an independent state.

In building this empire, however inadvertently, its citizens have shown down the centuries extraordinary vision, creativity, innovation, energy, leadership, diplomacy, skill, artistry, sometimes pure genius and, more often, downright doggedness. Voltaire

might have over-egged the pudding but in all these areas, I believe, our small nation has punched well above its weight and has earned his generous compliment. A fine conceit? An extravagant claim? Read on before you judge.

These few chapters include, for example, the Scots who…

invented radar, television, the telephone, the forerunner of the fax machine, the pneumatic tyre, the bicycle, the steam engine, the iron ship, gas lighting, the flashing lighthouse, the breech-loading rifle, the electric clock, the mackintosh raincoat, tarmac, the vacuum flask, the Anderson air raid shelter, tubular steel, Telford bridges and hundreds of other essentials… as well as the not-so-essential fountain pen, sticky postage stamp and kaleidoscope;

pioneered medical breakthroughs with penicillin, antiseptics, quinine, anaesthetics, insulin, beta-blockers, a cure for scurvy (which included the consumption of limes and led to British sailors being called 'limeys'), birth control, chloroform, ultrasound, the hypodermic syringe and the MRI scanner;

won Nobel prizes for chemistry (for the discovery of five of the six noble gases), physics, medicine and for other important contributions to the peace of the world;

founded (or reorganised) the modern navies of the United States, Australia, Chile, Russia and Japan, provided admirals for Peru, Brazil and Greece, but also brought terror to the high seas in the shape of the notorious pirate Captain Kidd;

fought gloriously on battlefields across the globe and won hundreds of awards for bravery, including 169 Victoria Crosses;

served as generals and field marshals all across Europe including Holland, France, Prussia and Russia and with the ANZAC forces in the First World War, and helped set up the Royal Flying Corps, the Women's Royal Air Force, the Royal New Zealand Air Force, the Special Operations Executive, the SAS, the Territorial Army and the Royal British Legion;

provided a fistful of prime ministers and other senior politicians for Australia, New Zealand and Canada and nine for Britain (including the first Tory PM), five of India's viceroys, a goodly number of America's founding fathers, and the first secretary general of the League of Nations;

established great educational institutions including America's second college (the William and Mary in Virginia), Princeton in New Jersey, Harvard Medical School, McGill University in Montreal, Imperial College of Engineering in Tokyo, Birkbeck College in London, and the Open University, the world's first distance-learning university;

introduced tea to India and improved the quality of America's coffee;

saved America's buffalo from extinction;

launched the famous Cunard Line, Japan's industrial giant Mitsubishi, Australia's transcontinental railway, America's great Pinkerton Detective Agency (and coined the term 'private eye'), Canada's famous Mounted Police, the Buick Motor Company, San Francisco's famous cable cars and the world's first municipal fire brigade;

created *Encyclopaedia Britannica*, the *Oxford English Dictionary* and *Chambers Dictionary*, the novel, the historical novel and children's picture books;

made the first transatlantic air flight (Sir Arthur Brown of Alcock and Brown)

built the RMS *Queen Mary*, the *Queen Elizabeth*, the *QE2* and a fleet of other famous ships including the paddle steamer *Sirius*, the first steamship to cross the Atlantic non-stop;

discovered the Victoria Falls, the source of the Nile, the Yukon River, the Mackenzie River in Canada, the magnetic North Pole and Nova Scotia;

started the Bank of England, the Commonwealth Bank of Australia, Hong Kong's Jordan Mathie Bank, the great 1794 gold rush in California; and gave the world its very first savings bank and the decimal point;

fathered modern economics, geology, philosophy, freedom of the press, the Labour Party and the great British welfare state;

produced World and Olympic champions in athletics, boxing, swimming, motor racing, cycling, golf, snooker, darts and, improbably, curling;

wrote a vast library of books from *Sherlock Holmes* to *The Thirty-Nine Steps*, *Waverley* (the first historical novel) to *Whisky Galore, The Coral Island* to *The Prime of Miss Jean Brodie*, *Kidnapped* to *Treasure Island*, from *Winnie-the-Pooh* to *Peter Pan* and *Dr Finlay's Casebook* to *All Creatures Great and Small*;

inspired Rudyard Kipling's poem 'If', Mendelssohn's *Hebrides Overture* (*Fingal's Cave*) and his *Scottish Symphony*, Malcolm Arnold's *Four Scottish Dances*, and Paul McCartney's 'Mull of Kintyre';

spawned legendary characters including James Bond, Thomas Crown, Horatio Hornblower, Robinson Crusoe, Lieutenant Pinkerton, Dr Jekyll and Mr Hyde, Young Lochinvar, the Admirable Crichton, Professor Moriarty, Dr Watson, Richard Hannay, John Bull, Pooh Bear, Toad of Toad Hall, Peter Pan, Captain Hook, Long John Silver, Wee Willie Winkie, the voice of Mickey Mouse and an array of cartoon heroes – from Desperate Dan to Dennis the Menace – from *The Dandy* and *The Beano* (the world's oldest comic); and

gave birth to the BBC – for me, still the world's greatest broadcasting organisation – and a subsequent stream of television icons like Victor

Meldrew, Rab C Nesbitt, Dr Finlay, Dr Cameron, James Herriot, Taggart, Rebus, Hamish MacBeth and the Laird of Glenbogle.

Down through the centuries, Scots have made the world a better place. Our doctors have made it a healthier place. Our engineers have ingeniously contributed to making it a more efficient place in which to live. Others have been a civilising influence through their writings and political convictions, through economic policies, trade unions, fairness and equality, through concern for the common man, pioneering, questing and, above all, through their restlessness.

Scots are not the most contented spirits. They find it difficult to be passive. The status quo does not feature greatly in our vocabulary. That's not to suggest we are a nation of saint-like marvels. We have more than our fair share of dullards, drunkards, despots, crooks and thugs. However, having thus acknowledged their existence, I unashamedly linger no longer on negatives. There is too much to celebrate.

All the major inventions and the more important discoveries are, of course, well tabulated and while it's important to acknowledge them as part of the totality, I don't need to replicate *those* stories of genius and enterprise. But beyond the names we learned about at school, there is another great raft of ingenuity and perseverance, and a host of heroes about whom much less has been written. Together, the well-known and the not-so-well-known show the Scots' considerable contribution to the world and to my imaginary empire. That's the substance of this commentary, which can only be a series of journalistic snapshots but which may hopefully stimulate readers to dig deeper into some of the personalities. Many of them are worth a book in their own right.

Some of my empire builders made their name working within Scotland, hunched over Bunsen burners, test tubes, blueprints and the brouhaha of invention and reinvention, producing their artefacts, burning the midnight oil, examining and re-examining philosophy, pouring forth their theories and trying to make life better for their fellow men and women. Others achieved it abroad, many after perilous journeys to the far corners of the world: discovering new places, administering new countries, creating new ways of doing things and providing leadership in myriad ways.

As a result of this diaspora, Scottish place names are strewn liberally across the globe in evidence of the Scots propensity to travel hopefully. There are thousands of examples but my favourite is Glasgow in Kentucky. It's a small agricultural centre as different from Scotland's dynamic industrial capital as it's possible to get. It has a population of less than 15,000 but has its own annual Highland Games and is a clear indication that the Scottish travellers never forgot their origins. Perhaps the very best example of this is the United States' recognition of April 6, the anniversary of the signing of the Declaration of Arbroath, as Tartan Day, an occasion when they acknowledge Scotland's huge contribution to their history and celebrate all things Scottish. Would America do that if it weren't for the Scottish influences so deeply embedded in the national psyche?

Although he attributed the emotion to Highlanders, Burns was speaking for most Scots in his poem:

'My heart's in the Highlands, my heart is not here,
My heart's in the Highlands a-chasing the deer;
Chasing the wild deer, and following the roe,
My heart's in the Highlands, wherever I go.'

Distance, it seems, was never a deterrent and nor was mode of transport. When it was all that was available to them, they bravely sailed in frail ships across angry seas and raging rivers. They endured severe hardship as they trekked across mean deserts, wild prairies and bleak ice fields. They ignored physical exhaustion as they hacked their way through dense jungles and ingeniously found ways to cross towering mountain ranges. It's easy to see where Harry Lauder got the inspiration for his signature tune, 'Keep Right on to the End of the Road'. And always, the Scots were at the leading edge when it came to the *means* of travel: they helped develop steam engines that made the ships go faster, railways and locomotives that transformed land travel, and they were up there with the pioneers of aviation. Equally awe-inspiring, they made great journeys of the mind via the high tables of Scotland's universities and the lecture rooms of the learned institutions.

My problem has not been, as some sceptical Sassenach friends forecast, a lack of material. More than one gleefully predicted this would be a very short book if it was to be about *great* Scots! In honesty, my struggles have not been in finding names to include but in editing the ever-growing list into something vaguely cohesive. And I have only just scratched the surface: there is but a passing reference to Robert Burns and his vast canon of poems and songs (including 'Auld Lang Syne', sung around the globe almost as often as 'Happy Birthday'), and nothing of the Edinburgh Festivals (launched in 1947 and today one of the world's most lively cultural events) nor much of the Enlightenment.

It's hard to imagine the atmosphere that must have pervaded Scotland during that golden, febrile period – somewhere between 1740 and 1800 – when sharp intellects came together in glorious and unique fusion. It's equally difficult to determine just when the Enlightenment gained its capital 'E' but it was clearly a time when restless minds broke free from academic and social constraints to debate, as never before, in the areas of moral philosophy, social history, economics and the ethics of capitalism, not to mention mathematics and geology and chemistry and every subject under heaven. There was High Table discourse and argument among the most erudite academics in the nation's universities, and the intellectual diet ranged from David Hume's moral philosophy to Adam Smith's economics, from the profundity of James Hutton's geological studies to the original theories of the chemist Joseph Black.

Imagine what it might have been like if they had had today's communication tools – the personal computer, television, radio, the mobile phone and the profusion of social

networks. Imagine Mr Hume theorising on a walk through Edinburgh when some thought about moral philosophy strikes him: what if he had been able to access the internet? Imagine how Jeremy Paxman and his television cohorts might have coped with shaping intelligent and illuminating interviews: 'Mr Hume, you say you have to be good to do good: does it follow that if you do good you *are* good?' Hume (born Edinburgh, 1711–1776), probably the leading figure of the Enlightenment, is best known for his *Treatise of Human Nature*. He wrote it when he was 28 and, for the first time, applied scientific reasoning in resolving moral issues. He was able to test many of his ideas in rigorous debate with the Glasgow University philosophy professor Francis Hutcheson. In a 2005 poll, Hume was voted as the Scot who had made the greatest impact on the world in the past 1,000 years.

His young associate, Adam Smith (born Kirkcaldy, 1723–90), had gone to Glasgow University when he was just 14 and by the time he was 23 was lecturing in rhetoric at Edinburgh. There was nothing precocious, however, about his seminal work *The Wealth of Nations*. It took ten years to research and consider before he was ready to publish it in 1776 and is of course said to be the basis for many of today's market economy theories. He later became Lord Rector at Glasgow. James Hutton (born Edinburgh, 1726–97), a one-time gentleman farmer, published his *Theory of the Earth* in 1785 and in it described his ideas about the formation of the Earth's crust. His theory was that the slow processes that had created and shaped the Earth were still ongoing. He was the founder of modern geology and is often described as 'the man who found time'. Like Smith, Joseph Black (born Bordeaux, France, 1728–99) also brought the two great universities together. He was professor of anatomy and chemistry in Glasgow and, later, professor of medicine and chemistry in Edinburgh. Among his many successes, he established the importance of quantitative experiments and invented the first accurate method of measuring heat – indeed, a version of his calorimeter is still in use today. He is regarded as the father of modern chemistry.

There were many other clear minds drawn into the tight, golden circle of the academic intelligentsia, but even outside it the likes of Robert Burns (1759–96) were making their mark. Although Burns was at his most creative during the latter half of the period, Scotland's national bard is not acknowledged as part of the Enlightenment. Yet there's a single poem that, despite his reputation as a womaniser, surely stamps him out as a radical philosopher well ahead of his time. It is 'The Rights of Woman', which he wrote in 1792.

While Europe's eye is fix'd on mighty things,
The fate of empires and the fall of kings;
While quacks of state must each pronounce his plan,
And even children lisp the Rights of Man;
Amid this mighty fuss just let me mention,
The Rights of Woman merit some attention.

First on the sexes' inter-mix'd connexion,
One sacred Right of Woman is protection.
The tender flower that lifts its head, elate,
Helpless, must fall before the blasts of fate,
Sunk on the earth, defac'd its lovely form,
Unless your shelter ward th' impending storm.

Our second Right – but needless here is caution,
To keep that right inviolate's the fashion,
Each man of sense has it so full before him,
He'd die before he'd wrong it – 'tis decorum.
There was, indeed, in far less polish'd days,
A time, when rough, rude man had haughty ways;
Would swagger, swear, get drunk, kick up a riot,
Nay, even thus invade a lady's quiet.

Now, thank our stars! these Gothic times are fled;
Now, well-bred men – and you are all well-bred –
Most justly think (and we are much the gainers)
Such conduct neither spirit, wit, nor manners.

For Right the third, our last, our best, our dearest,
That right to fluttering female hearts the nearest,
Which even the Right of Kings in low prostration
Most humbly own – 'tis dear, dear admiration!
In that blest sphere alone we live and move;
There taste that life of life – immortal love.
Smiles, glances, sighs, tears, fits, flirtations, airs,
'Gainst such an host what flinty savage dares –
When awful Beauty joins with all her charms,
Who is so rash as rise in rebel arms?

But truce with kings and truce with constitutions,
With bloody armaments and revolutions,
Let majesty your first attention summon,
Ah! ça ira! the majesty of woman!

I heard that read with tremendous feeling by a Russian woman at an otherwise bizarre Burns supper in Moscow. She was a professor of English and her impeccable presentation brought a storm of applause from her university colleagues and left British guests in awe. I'd been in the city researching a programme for the BBC when an Irishman, of all people, invited me to propose the immortal memory at a 'little bit of a Burns do' he was organising.

It turned out to be something more than that. There were about 300 guests from the various diplomatic communities and a healthy smattering of Muscovite intelligentsia. When the time came to address the haggis, the great chieftain o' the puddin' race turned out – in a glorious example of Irish initiative – to be an ancient tin of shortbread. The real thing, ordered from Scotland, had fallen foul of the Russian customs officers who, no doubt, had great difficulty in identifying it as an innocent, edible delicacy! It was not easy to keep a straight face as I symbolically scratched the shortbread tin with a borrowed carving knife.

There's little that hasn't been written about Burns' life and lifestyle but I continue to be astonished at his enduring appeal. No other Scot commands such universal acclaim that his birthday is celebrated just about everywhere around the world. The United States has hundreds of Burns Clubs (and not a few St Andrew's and Caledonian Societies) and that's matched pro rata in Canada, Australia, New Zealand and, indeed, any place where more than a half a dozen Scots, Scots' descendants or wannabe Scots are gathered together. I've read reports of Burns suppers to celebrate the bard's birthday being held in many unlikely places around the world, including Beijing: one can only wonder what the 800 guests of the city's Drama Academy made of the haggis!

Burns, very much the people's poet, has clearly influenced many later writers. John Steinbeck, for example, paraphrased one of his lines 'The best laid schemes o' mice and men/Gang aft agley,' from 'Ode to a Mouse' for the title of his novel *Of Mice and Men*. More recently, Bob Dylan cited Burns as his greatest inspiration and quoted 'A Red, Red Rose' as the lyric that has had the greatest effect on his life. There is another theory that Burns also gave the Mexicans their *gringo* (meaning American) after hearing a US cavalry unit (supplemented by more than 80 Scots mercenaries) defiantly singing the refrain of the Bard's 'Green Grow the Rashes, O' at the Alamo in 1836. Perhaps the ultimate tribute to Burns came from Abraham Lincoln. He had often said the Scot was his favourite poet and that he could recite most of his work from memory, but when asked to toast the immortal memory, the great man's response was: 'I cannot frame a toast to Burns because I can say nothing worthy of his generous heart and transcending genius.'

Underpinning the cliché of the Scottish doctor is the reality of the medical men who attended everyone from Napoleon to the Duke of Wellington, from the Tsars of Russia to George Washington and of course a long line of British monarchs. Many more Scottish clinicians contributed to the care of ordinary folk around the globe by tending to their needs, devising new therapies and discovering new drugs.

The man who looked after Napoleon and witnessed his death on St Helena in 1821 was Dr Archibald Arnott, from Ecclefechan in Dumfries. He was a Royal Navy doctor and for his services, he received 12 francs, a snuff box and a locket containing some of Napoleon's hair. All the Tsars from Peter II to Nicholas II – stretching over more than 150 years – had Scottish doctors (see Chapter 8: Reaching for the Tsars). George Washington's doctor was Dr James Craik from Arbigland in Dumfriesshire. He was physician general to the United States Army from 1798 to 1800 and served

under Washington in his campaigns against the Indians. He diagnosed the president's fatal illness, treated him until his final hours and was remembered in his will: 'To my compatriot in arms and old and intimate friend, Dr Craik, I give my bureau and the cabinet chair, an appendage of my study.'

The first Scottish royal doctor I have found was Arthur Johnston of Caskieben in Aberdeenshire. He was physician to Charles I in 1625. He graduated from Padua University, practised in France, returned to Britain to tend the king and later became rector of Aberdeen University. Sir Andrew Hallidie from Dunfermline was doctor to King William IV and Queen Victoria, while both her personal physician and personal surgeon were also Scots. Sir Robert Christison from Edinburgh looked after her health and still found time to act as chairman of the committee that prepared the first *Pharmacopoeia of Great Britain and Ireland* in 1864. Her surgeon was Sir William Fergusson from Prestonpans, who was also president of the Royal College of Surgeons.

Major General Thomas Menzies from Aberdeen was doctor to King George VI from 1949 to '52. He had served in the Royal Army Medical Corps in both world wars and been appointed professor of tropical medicine at the Royal Army Medical College in 1940. He was also director of medical services at the General Headquarters of the Middle East Land Forces (1948–50). Another army man, Major General Ian Campbell Crawford from Dumfries, had been director of army medicine before becoming physician to Queen Elizabeth II from 1990 to '99; he was a cardiology consultant. It was yet another royal physician and soldier who might be regarded as the father of military medicine. Sir John Pringle, from Stichill in Roxburghshire, was physician to King George III and physician general to the British Army in the Netherlands in 1744.

Although the earliest armies had medical services of a sort, it was he who set out to rationalise the care of soldiers and improve camp sanitation. In 1752, he made rules for the prevention of dysentery, one of the scourges of the day. He had noticed a relation between putrefaction and disease, and his treatment dramatically reduced military deaths. He was elected president of the Royal Society in 1772. The next major step forward came when Sir James McGrigor, from Cromdale, laid the foundations for the establishment of the Royal Army Medical Corps. He was the Duke of Wellington's Surgeon General during the Peninsular War (1808–14) and, in 1815, he undertook a dramatic reorganisation of what was then the Army Medical Department. He read medicine at Aberdeen University and Edinburgh University before joining the army as a surgeon in 1793. He served with the 88th Regiment of Foot in Flanders (1794), the West Indies and India (1799). In 1801, as Superintendent Surgeon in Egypt and despite suffering from malaria himself at the time, he set up an isolation hospital to deal with an outbreak of plague. Following the Battle of Waterloo, he instigated the changes in the Army Medical Department in 1815. He established a system for the evacuation of the wounded and arranged for prefabricated huts to be sent from Britain for use as convalescent depots, which meant that those who recovered quickly could be kept in the field. He further improved the standards of cleanliness and sanitation both in the

field and in the barracks, which reduced deaths from cholera, dysentery and typhus. He also introduced the stethoscope to military medical practice and created a specialist ambulance corps to get injured and sick personnel to his field hospitals or back to Britain. He was knighted and appointed director general of the Army Medical Service, a post he held for 36 years.

It was another 40 years, however, before the RAMC was finally created from the merger of the Army Medical Service and the Medical Staff Corps in 1898. One of the early commandants of the Corps was Major General Sir William Grant Macpherson (who was also author of its official history). During the Great War, he served in France as deputy director of General Medical Services, was mentioned in dispatches nine times and received additional honours from France, Italy and the United States. When he died in 1929, an obituary said, 'he was popularly known as 'Tiger Mac,' a name not given him on account of anything ferocious or daring in his character but as a tribute to his energy, thoroughness and singleness of purpose.' On a memorial tablet in Edinburgh's St Giles Cathedral, his RAMC colleagues inscribed: 'In humble gratitude for his great and distinguished service.'

It was a former RAMC officer, Professor Ian Aird (born Edinburgh, 1905–62), who developed the kidney transplant in the UK. He carried out the first transplant where donor and recipient were not identical twins. He also hit the headlines in 1953 when, as Professor of Surgery at the University of London, he separated a pair of Nigerian conjoined twins, one of whom survived. It was the first time the operation had been undertaken in Britain. During the Second World War, he served with the Eighth Army in North Africa and was leader of a mobile surgical unit which saved hundreds of lives on the front line. He was twice mentioned in dispatches. According to a piece written by Iain Macintyre in *Surgeons' News* in 2008, Aird operated on a German officer injured in the fighting: 'As the tank warfare ebbed and flowed across the desert, Aird's unit was overrun by a panzer column. The medical officer of the German unit sought the surgeon in charge and when Aird introduced himself, the German doctor asked, "are you Aird of Edinburgh?" When an astonished Aird replied that he was, the German doctor went on to explain that he had read with interest about Aird's work… he was then asked to operate on a senior German officer who had sustained a serious chest wound. After successful resuscitation, Aird performed a thoracotomy… surrounded by a ring of German officers including Field Marshal Rommel himself.' Unfortunately, he was unable to save the man's life but his colleagues were appreciative of Ian Aird's efforts.

More recently, Air Marshall Sir John Alexander Baird from Aberdeen was surgeon general of the Armed Forces (1997–2000), having previously been the RAF's director general of medical services between 1994 and 1997. He is a member of the International Academy of Aviation and Space Medicine.

Scots, doctor, pioneer: these words go together so readily that it's impossible to do more than offer the briefest of tasters about a handful of pioneering Scottish doctors. William Cullen, from Hamilton, became Britain's first chemistry professor (at Glasgow

University) in 1751. He was the foremost medical teacher of his time and was mainly responsible for recognising the important part played by the nervous system in health and disease. He published an edition of the *Edinburgh Pharmacopoeia* in 1776.

Brothers John and William Hunter, from East Kilbride, were a remarkable pair. John, the younger by ten years, was an anatomist and physiologist and the founder of scientific surgery, previously practised by barbers. He was surgeon extraordinary to King George III (1776), surgeon general to the Army (1790) and pioneered tissue grafting and dissection. One English writer said of him, 'as a physiologist, he was equalled by Aristotle but as a pathologist he stands alone.' His *Natural History of Human Teeth* (1771–78) is said to have revolutionised dentistry. Big brother William was also an anatomist and the founder of modern obstetrics, raising the practice of midwifery to a branch of medicine. He was personal physician to Queen Charlotte and attended 11 royal births (from 1762). He was the first professor of anatomy to the Royal Academy (1768) and president of the Royal College of Physicians. He went to Glasgow University when he was 13 and in 1770 built a house with an amphitheatre for lectures and a dissecting room – now the Hunterian Museum – which he bequeathed to Glasgow University with an endowment of £8,000.

Sir Charles Bell, from Doun-in-Monteath, conducted early investigations of the central nervous system, discovered motor, sensory and motor-sensory nerves – the most important discoveries in physiology since Harvey's circulation of the blood – and gave his name to Bell's palsy. He had been a surgeon at Waterloo and in 1824 became the first professor of anatomy and surgery of the College of Surgeons in London. Four years later, he helped found the Middlesex Hospital and Medical School.

In the mid 19th century Scot John Bennett discovered the medicinal use of cod liver oil as a source of vitamins A and D, while surgeon James Braid pioneered the use of hypnosis in medicine. His 1843 paper used the word 'hypnosis' for the first time. In 1847, Sir James Young Simpson from Bathgate pioneered the use of chloroform during childbirth, despite both medical and religious objections. He, too, served as personal physician to Queen Victoria and she allowed him to use chloroform during the birth of Prince Leopold in 1853. He was the first man to be knighted (in 1866) for services to medicine.

In 1854 Edinburgh surgeon James Syme, professor of surgery at Edinburgh University (1833–70), helped found the General Medical Council. He was said to be the greatest surgeon of his time and developed new amputation techniques aimed at reducing trauma in an era before anaesthetics, of which he was also an early advocate. He reduced the time needed to amputate a leg, for example, to a minute and a half and he also experimented with what is now plastic surgery. He had been medical superintendent of Edinburgh's Fever Hospital, where he himself caught typhus in 1820. Two years later, when he was banned from practising at the city's Royal Infirmary, he founded his own medical school to teach anatomy and surgery. He was president of the Royal College of Surgeons of Edinburgh from 1850.

Professor Alexander Bain from Aberdeen was ahead of the field in the study of psychology. He was professor in logic and English at Aberdeen University, 1860–80.

Between 1876 and 1891 he published, at his own expense, *Mind,* the journal that became the primary outlet for English language philosophy. Francis Maitland Balfour from East Lothian was a zoologist and founder of modern embryology and younger brother of Prime Minister Arthur Balfour. His *Treatise on Comparative Embryology* (1880–81) laid the foundations for modern embryology. He died climbing in the Alps. Sir Thomas Lauder Brunton (1844–1916), from Roxburgh in the Borders, a physician best known for his work on the circulation of blood in the body, discovered that amyl nitrite could relieve the agonising pain of angina. His writings, covering the use of digitalis, amyl nitrite and enzymes, were published as *Collected Papers on Circulation and Respiration* in 1907. Gynaecologist Sir Dugald Baird (1899–1986), from Dyce, Aberdeen, was a pioneer of maternity and neonatal care. He publicly supported and advocated therapeutic abortion according to social criteria relating to the wellbeing of the mother. He performed abortions within the NHS from 1950 and advised David Steel MP on drafting the Abortion Act 1967.

More recently, it was another Scot, Sir Kenneth Calman who held the key post of the government's Chief Medical Officer from 1991–98. He had previously been chief medical officer for Scotland, 1989–91. His biggest crisis was the BSE outbreak. In 2006, he was elected chancellor of Glasgow University, where he had graduated, lectured, held the chair in cancer research and was dean of postgraduate medical education. In March 2008 he was appointed chair of the commission to review Scottish devolution.

As evidence of how well the travelling Scot fits into any society, a politician from Falkirk was voted 'The Greatest Canadian of All Time' in a 2004 poll by listeners and viewers of the Canadian Broadcasting Corporation and an Edinburgh-born professor was named 'Australian of the Year' in 2007.

Tommy Douglas (1905–86) was a preacher turned politician and said to be the best prime minister Canada didn't have. He won the 2004 poll because, said the citation, 'he had the most profound impact on the nation'. He earned that accolade for having introduced Canadians to universal medical care, car insurance, the minimum wage, old-age pensions and a mothers' allowance and for having ensured women had the right to drink alcohol in bars. He gave up preaching for full-time politics during Canada's economic depression and was an unsuccessful candidate for the Farmer Labour Party in the 1934 election. He won the following year and served in the national parliament for nine years. He then went back to Saskatchewan, where he became leader of the Co-operative Commonwealth Federation and, at the age of 39, provincial premier of the country's first socialist government. He served five terms, during which he introduced free hospital treatment and universal publicly funded healthcare. In 1964 he also launched the Saskatchewan Power Corporation, which provided energy to more than 65,000 homes.

The Australia Day Committee named immunologist Ian Frazer their 2006 Aussie of the year for his work in cervical cancer treatment and prevention. He developed the vaccine Gardasil, which is said to prevent about 70 per cent of cervical cancer viruses. Professor Frazer emigrated after graduating from Edinburgh University in 1980.

He is currently head of the Diamantina Institute (formerly Centre for Immunology and Cancer Research) at the University of Queensland and acts as an adviser on papilloma vaccines to the World Health Organisation and to the Bill and Melinda Gates Foundation. On receiving his award, he said he would use his new profile to ensure that his cancer vaccine reached those who need it most: women and girls living in poverty. Perhaps ironically, it was Scots who penned both 'Rule Britannia' and 'Advance Australia Fair' and cast the first dollar sign at a Philadelphia type foundry. In James VI, Scotland gave Great Britain its very first monarch. He became James I on the Union of the Crowns in 1606 and promptly introduced the enduring and unifying symbol of the Union Jack. I've had countless arguments over the years with pedants who insist that it should be referred to as the Union Flag but the King James proclamation calls it the Union Jack and that's good enough for me. It isn't for use on ships, incidentally, but can be used anywhere on land without permission (unless you're planning to run it up a particularly grandiose flagpole, in which case you might need planning consent for the pole!). The same royal also gave us, of course, the King James Bible, said by scholars to be a masterpiece of translation.

While we can't – nor would I personally want to – lay claim to the British national anthem, it was a Scot who stimulated its first use in the theatre and subsequently at so many other public gatherings down the years. 'God Save the King' was first sung in public in London in 1745, after Bonnie Prince Charlie had defeated the army of King George II just outside Edinburgh. In a moment of patriotic fervour and to show support for their king, the management of the Theatre Royal had it played at the end of the performance. On impulse, the audience rose to its feet… and a very British tradition was born!

That minor tilt at royalty apart, I have neatly sidestepped the complex royal bloodlines of Scotland as an area for commentary. In any case, I'm sure everyone would agree there is already a sufficiency of excellent books on the subject in the libraries and Hollywood has, for those who need their history to be entertaining, added plenty of cinematic spin to the adventures of Bruce, Wallace, Bonnie Prince Charlie and Rob Roy MacGregor *et al*! These are works with which I could not compete.

Perhaps appropriately for a Scot, Allan Ramsay opened (in Edinburgh in 1725) the first public lending library in the world, making books freely available to those who couldn't afford to buy them. I continue to show my appreciation of the good Mr Ramsay by regularly borrowing books from my local library. He is, I would assert, more than worthy of his place on a plinth in Edinburgh's High Street, and in our empire.

With education being one of Scotland's finest disciplines, it's not surprising that the distinguished educationist Sir Eric Anderson, from Edinburgh, has had a hand in teaching the Prince of Wales (when he was at Gordonstoun), former Prime Minister Tony Blair (at Fettes College) and current Prime Minister David Cameron (at Eton)! Another highly successful teacher was William Garden of Glasgow, who in 1910 invented the revolving blackboard. In 1929 he also, more lucratively, created the tote

board, or totalisator, which transformed racehorse betting and saw it in operation for the first time the following year in Carntyne, Glasgow.

It is well known that Scotland has some of the oldest and most respected universities in Europe – St Andrews was founded in 1413, Glasgow in 1451, Aberdeen in 1495, and Edinburgh in 1583 – but it is less widely recognised that it can also lay claim to one of the earliest systems of compulsory education. This dates back to 1496 when, encouraged by Bishop Elphinstone, the founder of Aberdeen University, King James IV passed an Education Act decreeing that the eldest sons of all noblemen should attend school from the age of eight or nine. They were to study Latin and then go on to university to study law for three years. The new act was designed to improve the running of the country by producing well-educated judges to help keep unruly nobles in order, but despite the threat of a £20 fine for non-compliance, it was not widely enforced.

Education, such as it was, continued to be provided by the church. Certainly in the later 16th century, the leaders of the church in Scotland were keen that people should be literate so that they could read the Bible! In 1562, the General Assembly of the Kirk ordered that schools should be established in every parish. Sadly, despite further acts of Parliament in 1633 and 1646, there weren't enough teachers or schools to meet this worthy objective. The turning point came in 1696 when another act, that 'for the settling of schools,' ordered that a school should be set up in every parish and a schoolmaster appointed at an annual salary of up to £140. A number of benefactors also began around this time to establish their own schools to help the children of poor families. For example, George Heriot, the wealthy Edinburgh goldsmith, bequeathed more than £6,000 for the creation of a school in the city for 'poor, fatherless boys.' It was founded in 1628 and is still thriving today, although most of its pupils are fee-paying.

In those early days, the standard of teaching was variable to say the least because there was no recognisable training or assessment. That didn't really change until the 19th century when it was again the Church of Scotland that led the way toward establishing compulsory teacher training in both Glasgow and Edinburgh, although both the Catholic and Episcopal churches were also beginning to develop schools. In 1872, the Education (Scotland) Act established formal education for children from the age of five and brought schools under state control. Today, our schools retain many distinct features and Scotland can still lay claim to having a population that ranks among the highest-educated in the world.

To aid his contemporaries with their literary labours, Peter Roget (not a native Scot but a graduate of Edinburgh University, which paid for the research) devised a masterpiece of helpfulness. *Roget's Thesaurus* is probably the best crib sheet I ever found in my struggle to survive in the world of words. But then, I'm a journalist rather than anything as grand as a writer. I have always seen my role as that of a communicator passing on information. As will be painfully obvious from this book, I have never aspired to be a guardian of language, neither concerned about the splitting of infinitives nor enthusiastic about the conjugating of verbs. However, Mr Roget's work has never

been out of print since it was launched in 1852 and that suggests it is of inestimable value to more than the journalists among us!

As a diligent hack, I'm also particularly pleased that it was Andrew Hamilton, an Edinburgh lawyer, who was the pioneer of freedom of the press and firmly established it as an essential plank in modern democracy. He was aided and abetted by fellow Scot and lawyer James Alexander. After he had emigrated with his family to America in 1695, he dabbled in journalism and, together with Benjamin Franklin, also helped found the American Philosophical Society. I hope that, were he still alive, he might nod an acknowledgement of my own recent endeavours to help establish an international Centre for Freedom of the Media.

To show even-handedness, I should perhaps also mention another Scottish émigré, one James Callendar, said to be the father of the less-than-edifying yellow press. He began his new life in America writing political pamphlets for Thomas Jefferson, but ended up muck-raking and libelling various presidents (including his former friend Jefferson) and was jailed for sedition after a libellous attack on President James Adams. In the same inglorious vain, the last firing squad in the UK consisted of eight Scots Guards: it was for the execution of the German spy Josef Jakob in the Tower of London on 15 August 1941.

In more recent times, the ubiquitous Personal Identification Number (PIN) was devised and patented by James Goodfellow, of Paisley, in 1966. He was an engineer in his 20s, working for the Glasgow company of Kelvin Hughes, when he was tasked with finding a way for customers to withdraw money from the bank outside normal hours. His answer was the PIN and he took out the patent in May 1966. Forty years later, he was finally recognised with the award of an OBE in the Queen's Birthday Honours of 2006. Although he had not earned a penny from his invention, Mr Goodfellow was quoted as saying he did enjoy a smile every time he used a cash machine! He added modestly that he 'had only been doing [his] job' when he dreamt up the concept, but the PIN led inevitably to the ATM, liberated us all from the shackles of the seriously limited-hours banking systems and gave us back control of our money – while stocks lasted, of course.

The word 'millionaire' was first coined for Edinburgh's John Law in the early 18th century. He founded the Bank Générale in Paris in 1715 and issued the world's first paper money. Like so many of his compatriots, he was also an inveterate traveller and his wealth was represented not only in ownership of the famous Place Vendôme in Paris and a library of more than 50,000 books but also of vast tracts of America (most of which is now in Arkansas). At one point, reportedly, he had more than £750 million in the bank.

His father, a goldsmith and money lender, died when he was just 12 and the inherited wealth quickly led the young John Law into a fairly dissipated lifestyle. His mother tried to persuade him to go to university but instead he ran off to London. There, he seemed hell-bent on enjoying his new-found freedom and, almost inevitably, wasted much of his inheritance on gambling and the city's pretty young things. He would have found himself in the debtor's prison had his mother not come to his rescue. With this second

chance, he set out to regain his position as the popular young blade about town. Over six feet tall, dashingly handsome and extremely well dressed, he revelled in the nickname 'Beau Law'. He played the field of London's fashionable ladies and upset one love rival so much he found himself first in a disastrous sword duel and then in prison, having been found guilty of murder. But young Mr Law, still only 23, had almost as many friends as enemies and they rallied to him and somehow arranged his escape to France. There he met and eloped to Switzerland with a married woman, who he eventually married. It was then that he developed his interest in paper money as a way of overcoming the limitation of gold reserves. He decided to give Scotland the benefit of his brilliance but the bankers of Edinburgh, it appears, were either too sensible or too set in their ways to listen. His 1703 publication *Money and Trade Considered* went largely unread. So after ten years of struggling, it was back again to France, which was then in danger of an economic collapse. He somehow inveigled an association with the infant king's regent, the Duke of Orleans, and persuaded him on the idea of paper money. Soon, he had established what would become the Bank of France and later founded what we now know as New Orleans in the Duke's honour. As part of what was clearly a mutual admiration society, Law was showered with titles and riches by the French court. He was named King's Secretary and elected to the highly prestigious French Academy.

However, given his early reputation in London, it was inevitable that it should all end in tears. His banking system collapsed and, having lost the favour of his French sponsors, he ended up in exile in Venice in 1725. There he survived by gambling and when he died of pneumonia in a lodging house four years later, still only 58, one unflattering epitaph read: 'Here lies that celebrated Scotsman, that peerless mathematician who, by the rules of algebra, sent France to the poorhouse.'

Although the Scottish diaspora has spread, mostly gloriously, across the globe and left indelible marks in the most unlikely places, it's ironic that the two attempts to create something of a geographical empire by establishing colonies both ended in dismal failure.

The Darien venture – launched in 1698 by William Patterson, the Scot who had successfully founded the Bank of England just four years earlier – all but made Scotland bankrupt and saw the death of far too many brave Scots succumbing to the savage conditions in what had been promised as paradise. The Scots who, at the urging of Sir William Alexander and King James, settled in Nova Scotia and established the city of Halifax in 1749, were ignominiously thrown out after only 11 years and the territory returned to the French. It has to be said, however, that the usurpers had the grace to retain the Latin name for New Scotland. In their first occupation in 1604, they had called it Arcadia.

While my concept of the Scottish Empire is essentially about the men and women who have made their mark on the wider world, it would be impossible to overlook the global impact of *things* uniquely Scottish: tartan, kilts, bagpipes, whisky, porage (or porridge, if you prefer), shortbread, butterscotch, haggis, bannocks, oat cakes, black

bun, Edinburgh rock, Dundee cake, the digestive biscuit, Irn Bru, Harris tweed, Fair Isle sweaters, Inverness capes, Aberdeen Angus cattle, Border collies, Scotch terriers, Shetland ponies, tossing the caber, curling, sword-dancing, the thistle and lucky white heather.

Then there's the geography. At the heart of my empire, in the auld country, there are place names that resonate with millions around the world. Even if they have never visited Edinburgh, people in the five continents still know about the Forth Bridge, Princes Street, the Castle (and its annual Tattoo, broadcast to millions worldwide), the Edinburgh Festival (launched in 1947 and rightly acknowledged as one of the world's greatest cultural events), even the sickly-sweet Edinburgh rock, unlike any other kind of rock, and the arch, Morningside accent that is unlike any other accent! Rivalling that is Glasgow: Sauchiehall Street, the Broomielaw and the great Clyde shipyards, source of so many of the world's most famous ships, the magnificent Burrell Collection, and the Gorbals, infamously representing the less attractive side of Scotland. There's Aberdeen and its timeless granite face; Paisley, and that pattern; Inverness, its nearby Loch Ness monster and the best English accent in the realm; Silicon Glen, centre of the sunrise industries; Fingal's Cave, its splendours expressed so evocatively in Mendelssohn's *Hebridean Suite*; the Mull of Kintyre, inspiration for Paul McCartney's hit song; and the Cairngorms, Skye, Iona, Loch Lomond, Ben Nevis, Scapa Flow, the Trossachs, St Andrews (home of golf), Gleneagles and Gretna Green, once known only as a haven for runaway brides and their lovers but not too long ago revelling in the up-and-down exploits of its football team!

We've also tossed a fair few of our unique words into the melting pot of the English language including decibel (after Alexander Graham Bell), watt (James Watt), divot (only well-known to golfers but originally the sod used to roof crofts), haver (to talk nonsense), glen, loch, cairn and dunce which derives from the name of the medieval theologian John Duns Scotus (1256–1308). His adherents were known as Dunses but that became a term of ridicule among 16th-century humanists, who mocked them for their theological hair-splitting and their hostility to new ideas. Very un-Scottish!

However, instead of simply asserting claims on behalf of my compatriots, let me offer Winston Churchill's endorsement: 'Of all the small nations on earth, perhaps only the ancient Greeks surpass the Scots in their contribution to mankind.'

2

Nobel Scots

'He who never made a mistake, never made a discovery'
— Samuel Smiles

The ingenuity of my compatriots is truly astonishing. Down the years, Scottish engineers and scientists must have driven their families and friends mad with their anguished wrestling with problems and their manic delight in solving them. As the astute Mr Smiles suggests, there must have been many hiccups along the way but as with other aspects of my empire theory, we appear to have a better-than-average success rate. Most of the major, life-changing inventions are, of course, well tabulated, with libraries of books giving due testament to some of the greatest Scots including James Watt and the steam engine, John Logie Baird and television, John Boyd Dunlop and the pneumatic tyre, John Loudon McAdam and tarmac, Robert Watson-Watt and radar, and Alexander Graham Bell and the telephone. That allows me to simply nod respectfully in their direction and concentrate more on those of whom less has been written.

Apart from the enormous satisfaction of having their creations absorbed into everyday life, some of the brainboxes have also been well rewarded with glittering accolades such as the Nobel Prize. Established in 1901 (under the will of Alfred Nobel, the Swedish pacifist and chemist who, ironically, made his fortune from producing explosives… in a factory in Scotland), the prize honours its laureates 'for outstanding achievements in physics, chemistry, medicine, literature and for work in peace.' That seems to me a fairly solid platform from which to launch this chapter.

Nine Scots have been made Nobel laureates. They are well-kent figures, of course, and their achievements need little elaboration but, courtesy of the diligent reporting of many journalist colleagues at numerous newspapers, I can recount some of the

personal details that serve to underline their ingenuity. By following the chronology of their awards, I can neatly sidestep any problem of rating their importance. They are Sir William Ramsay, born Glasgow, 1852–1916 (prize for chemistry, 1904); John McLeod, born Cluny, Perthshire, 1876–1935 (prize for medicine, 1923); Charles Wilson, born Glencorse, Midlothian, 1869–1959 (prize for physics, 1927); Arthur Henderson, born Glasgow, 1863-1935, won the 1934 peace prize; Sir Alexander Fleming, born Lochfield, near Darvel, Ayrshire, 1881–1955 (prize for medicine, 1945); Lord Boyd Orr, born Kilmaurs, near Kilmarnock, 1880–1971 (1949 peace prize for his work on nutrition); Lord Todd, born Glasgow, 1907–97 (prize for chemistry, 1957); Sir James Black, born Cowdenbeath, Fife, 1924-2010 (prize for medicine, 1988) and Professor Sir James Mirrlees, born Minnigaff, Kirkcudbrightshire, 1936, won the 1996 prize for economics.

The first Scot to be honoured by the Nobel foundation was Sir William Ramsay, for his discovery of five of the six noble gases: argon (with Lord Rayleigh), neon, krypton and xenon in 1898 and later, helium (the sixth is radon, discovered by the German Friedrich Dorn). The importance of Sir William's work is evidenced by the astonishing honours heaped upon him by scientific colleagues around the world. He was made an honorary member of the Institut de France, the Royal Academies of Ireland, Berlin, Bohemia, the Netherlands, Rome, Petrograd, Turin, Romania, Vienna, Norway and Sweden, the Academies of Geneva, Frankfurt and Mexico, the German Chemical Society, the Royal Medical and Chirurgical Society of London, the Académie de Médecine de Paris, the Pharmaceutical Society, and the Philosophical Societies of Manchester, Philadelphia and Rotterdam. He also received the Royal Society's Davy Medal, the Royal Society of Chemistry's Longstaff Medal, an honorary doctorate from Dublin University, a prize of $5,000 from the Smithsonian Institution, one worth 25,000 francs from France and the German Chemical Society's 1903 AW Hoffmann Gold Medal. He was knighted in 1902 and was also made a Knight of the Prussian order *Pour le mérite*, a Commander of the Crown of Italy and an Officer of France's *Legion d'Honneur*.

After reading chemistry at Glasgow University, William Ramsay went on to take a doctorate at the University of Tübingen under the renowned German chemist Wilhelm Fittig. He returned to Glasgow as an assistant at the Anderson College before being appointed Professor of Chemistry at Bristol University in 1879. Two years later, he became principal of the university but continued to combine administrative responsibility with active research in organic chemistry and on gases. In 1887, he moved to take the chair of chemistry at University College London, where his most notable discoveries were made.

For farmer's son Charles Wilson, a family holiday on the Isle of Arran and a fortnight as a volunteer at the Ben Nevis Observatory were the inspirations leading to the scientific work which made him the only Scot to win the Nobel prize for physics. He was 15 when he stayed on Arran and, with classic teenage inquisitiveness, soon became enthralled by close-up experiences of the beauty and wonders of nature. Arran, in the

Firth of Clyde between Ayrshire and Kintyre, is less than 20 miles long and only about 10 miles wide but it would be hard not to appreciate the amazing variety of landscapes and seascapes it contains. The coastline, with its sandy fringes, contrasts with the dramatic and rugged mountains to the north and the gently rolling green hills and woods to the south. By the time Wilson went back to college after his holiday, he had already resolved to make his career the study of the natural world in all its glory, and he spent hours in the laboratory looking down a microscope at the tiny specimens he had collected from local ponds.

Ten years later, after a change of direction from biology to physics and two desultory years of uncertainty about his career, he decided to spend a couple of weeks of his summer break from a teaching job acting as a volunteer observer on Ben Nevis. Enduring the routine of recording the weather every hour for a fortnight (to provide the basis of weather forecasts for shipping in the Atlantic), clearly instilled a discipline that was to stand him in good stead later in his career. More importantly, living on the peak of Britain's highest mountain in that September of 1894, he was again gripped not just by the beauty but also the power of the natural world, by the coronas and glories seen through the mist and by the ever-changing cloud formations. Fascinated he might have been, but according to his own recollections in the *Notes and Records* of the Royal Society, he was very much uncertain about his future career path: 'I could not imagine what career I was fitting myself for as there were remarkably few openings for trained physicists. I felt I might be of use as an explorer as I had some knowledge of a wide range of sciences and powers of endurance tested on the Scottish hills. The prospects of gaining admission into an electrical engineering works seemed rather remote.'

In the end, he decided to stay with physics, developing his interest in meteorology and using university resources to reproduce under laboratory conditions the cloud formations he had seen from Ben Nevis. From that eventually came the cloud chamber and the Nobel prize, 'for his method of making the paths of electrically charged particles visible by condensation of vapour.' The cloud chamber became an indispensable detection device in nuclear physics. Wilson studied atmospheric phenomena all his life and his work is said to be the basis of our understanding of what is involved in thunderstorms.

Charles Wilson shares the honour (with two other scientists with the same surname) of having the Wilson Crater on the moon named after him and he also gives his name to the Wilson Society (for natural sciences) at Sidney Sussex College, Cambridge.

As a diabetic, I have a deeply personal interest in John Macleod and his discovery of insulin. It's not exactly great fun jabbing oneself with a needle four times a day but it certainly beats the alternative! (I'm also grateful for the more recent work of two Glasgow scientists, John Ireland and Professor David Wyper, in developing the new pen-style syringe that makes the whole business of injecting insulin as easy as possible.)

A son of the manse, JJR Macleod as he is better known went to grammar school in Aberdeen and then on to study medicine at Marischal College at the city's university.

He graduated in 1898 with honours and the Anderson Travelling Fellowship. With that, he was able to work for a year at the Institute for Physiology in Leipzig. In 1899, then 23, he returned as demonstrator of physiology at the London Hospital Medical School, and was promoted to lecturer three years later. He then won another signal honour, a research studentship of the Royal Society which he held until 1903, when he was appointed professor of physiology at an American university. In 1918 he took up a similar post in Toronto and it was there, in 1921, that he linked up with the young scientist Frederick Banting, with whom he was to jointly receive the Nobel prize for their discovery of insulin. This was universally hailed as one of the most significant advances in medicine and insulin was being mass produced within months.

John Macleod wrote a number of books including *Recent Advances in Physiology* (1905); *Diabetes: its Pathological Physiology* (1925); and *Carbohydrate Metabolism and Insulin* (1926). In 1928, in failing health, he returned to Aberdeen as regius professor of physiology and consultant to the Rowett Institute for Animal Nutrition (created by John Boyd Orr). He died there at the early age of 59.

The University of Toronto named the auditorium of its medical science building after him and, as recently as 2005, Diabetes UK named its London offices in his honour. Among the many other honours bestowed on him, he was elected fellow of the Royal Society of Canada (1919), the Royal Society (1923), the Royal College of Physicians (1930) and the Royal Society of Edinburgh (1932); he was president of the American Physiological Society (1921–23) and of the Royal Canadian Institute (1925–26). He was awarded honorary doctorates of the universities of Toronto, Cambridge, Aberdeen and Pennsylvania, the Western Reserve University and the Jefferson Medical College. He was made an honorary fellow of Italy's Accademia Medica, corresponding member of the Medical and Surgical Societies of Bologna and Rome, a fellow of the Leopoldina Academy of Sciences in Halle, Germany, and Foreign Associate fellow of the College of Physicians, Philadelphia.

Few Nobel prize winners can have had a more varied career than John Boyd Orr. To describe him as a polymath seems a limp understatement. If you were to create a fictional character in his astonishingly dynamic image, no one would believe it.

He started working life before he was 18, as a student teacher at an infant school in Saltcoats, Ayrshire, and augmented his meagre salary of £10 a year by giving night classes in book-keeping and accountancy *and* working the odd day in his father's quarry. He won a Queen's Scholarship to complete his teacher training, and that covered both his classes and accommodation at a Glasgow college. When he finished there, he found teaching really wasn't his bag but he dutifully fulfilled his obligations under the scholarship. After that, he went to university to read biology, but with half an eye on a well-paid career he also studied medicine and qualified as a doctor. A bursary had covered his studies but not his living expenses and he inevitably ran up uncomfortable debts. His solution was to take out a mortgage to buy a small block of flats, which he then rented out! He still had an overdraft when he left university and to pay it off, he

worked for four months as ship's surgeon on a merchantman trading between Scotland and West Africa.

Once ashore and debt-free, he took up a post as a family doctor but the lure of pure research proved too much. He gave up practice to go back into academia. Not just any academic job, of course. He went to Aberdeen University as professor of agriculture, in the belief that there was an established institute for animal nutrition. What he found, to his horror, was what he described as 'a wooden laboratory in the wilds of Aberdeenshire'. Undeterred, he set about with his usual energy and enthusiasm both fulfilling his professorial responsibilities and developing, from scratch, an institute for animal nutrition, the first of its kind in Britain.

At the outbreak of the First World War, he quickly saw where his duty lay. He set aside his great plans and signed on with the Army Medical Corps. Initially, he served with a unit assigned to improve sanitary facilities in the emergency training camps around Britain and, characteristically, he pushed through a number of schemes to improve conditions and prevent sickness among the young conscripts. But that was never going to be enough to occupy his febrile mind and he insisted on going to the front. He was attached to the Sherwood Foresters, joined the infantrymen in the trenches and tended the wounded. Again, his wholehearted commitment to the job in hand earned him the admiration of the soldiers and won him the Military Cross on the Somme and the Distinguished Service Order at Passchendaele. That might have been enough grim action for lesser mortals, but not the young Boyd Orr. He transferred to active service in the Royal Navy, where he still found time to undertake a close study of military diets.

He returned to Aberdeen in 1918 and resumed his research on his nutrition project with renewed conviction. There, he showed himself adept – though reluctant – at raising much-needed funds. He persuaded the wealthy businessman John Quiller Rowett, who had financed Shackleton's final polar expedition in 1922, to contribute to the development of the Institute. Equally importantly, he talked the government of the day into match-funding the scheme. In 1920, Mr Rowett provided the money to buy a 41-acre site and another £10,000 towards the building costs, while the government provided the rest. Two years later, the Rowett Institute was opened by Queen Mary.

The one proviso the benefactor had insisted upon was a clause in the raison d'etre of the Institute: if any work on animal nutrition was found to have a bearing on human nutrition, the Institute would be allowed to follow it up. Well, of course it did and, inevitably, John Boyd Orr's focus switched and his research led him into lobbying to improve people's diet. One of his proposals was the introduction of free milk for schoolchildren, an initiative that is credited with ending the problem of rickets.

When he retired from the Institute at the age of 65, he hardly paused for breath. He fought and won a parliamentary by-election in April 1945 and was elected as independent MP for the Combined Scottish Universities. He held the seat at the general election three months later but resigned in 1946… to concentrate on another new and massive job: that of the first director general of the UN's new Food and Agriculture Organisation.