

An unknown Carrickfergus scientist: William H B Cameron

Carrickfergus claims at least one scientist in its history – Arthur Dobbs, the 18th-century governor of North Carolina, who studied many different natural phenomena. But asked to name a 20th-century scientist from the town and almost everyone will draw a blank. If you were told that this man's name, given to one of his discoveries, is still in everyday use by 21st-century space scientists, you might suspect a leg-pull. But just such a person, an uncle of the writer, was born in Albert Road in 1901.

He was William Henry Beattie Cameron, whose father Gibson was joint partner in a family-run bakery business in North Street. Young Billy attended Carrickfergus Model School, where headmaster Thomas Faulkner entered him for the Royal Belfast Academical Institution's entrance examination. With two other younger siblings to support, "Inst" fees would have been beyond the Cameron family's means, but boys who came top in this exam could win free scholarships to the school, and Billy did just that.

He prospered in scientific subjects at "Inst", and from the school won another scholarship to Queen's University Belfast, where he graduated BSc with honours in both experimental and mathematical physics in 1923. After a Master's degree, awarded in 1924, he continued



William Cameron at his BSc graduation in 1923.

to pursue research there in his chosen discipline, spectroscopy.

Billy Cameron's breakthrough came in 1925 when he identified a set of hitherto unrecognised ultraviolet "bands" of the gas carbon monoxide (CO). His report of the discovery was buried inconspicuously in a paper entitled "The production of some spectra of carbon, oxygen and nitrogen in the presence of neon", published in the *Philosophical Magazine* in February 1926. But the bands' significance must have been quickly recognised, for within months they were being referred to as the "Cameron bands". You might expect that they would now be of interest only to academic historians, but with today's need to understand better the behaviour of gases in the upper atmosphere

under the combined effects of solar radiation and man-made pollution, the Cameron bands have become a more widely used research tool than Billy could ever have dreamed of. In particular, the excitation of carbon monoxide can arise when another molecule, carbon dioxide (the greenhouse gas CO₂) absorbs a photon of light, causing it to break down into CO and oxygen. The CO then releases energy that appears as an emission of ultraviolet light. The Cameron bands act as a marker for the presence of both CO and CO₂ in the atmosphere.

Tracking one of the many modern references to the Cameron bands on the Internet, I contacted Dr Hal Weaver of Johns Hopkins University, Maryland, one of the US's leading space scientists. I asked him about the significance of Billy Cameron's discoveries to his work, and immediately received the reply: "The Cameron bands of CO, and hence your uncle's original characterisation of them, remain of vital interest to planetary scientists and astronomers. These bands provide an important tool for probing the carbon dioxide abundance in comets. Emissions in the Cameron system dominate the ultraviolet emissions from Mars, whose atmosphere is composed primarily of carbon dioxide gas. The Cameron bands have also been detected by astronomers in

the interstellar medium. Quoting from a paper published by the Royal Astronomical Society in 2000: "The Cameron band emission in the Red Rectangle [a nebula] may be a unique example of a chemical reaction beyond the Solar System serving as a source of ultraviolet emission". Thus you can see that your uncle left quite a legacy for the world's scientific community."

There is renewed interest in the Cameron bands today. Until the advent of satellite telescopes, ultraviolet light of astronomical origin could not be detected because such radiation was absorbed by the Earth's ozone layer. However, with the launch of such instruments as NASA's International Ultraviolet Explorer (IUE) and the Hubble Space Telescope we now have the scope to detect such phenomena as the Cameron bands in places where it was not previously known. Hence the ongoing usefulness of the Cameron bands in modern astronomy and physics.

In late 1926 Billy Cameron moved to a lectureship in Sheffield University where he continued research in spectroscopy. Then, sadly, on a visit home at Christmas 1937 he contracted septicaemia and in those pre-penicillin days he died a few weeks later at the age of 36. However, his legacy remains in the Cameron bands.

Robin Cameron