

Pioneering amateur ahead of the game

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Percy Ludgate (1883-1922): Ireland's First Computer Designer
By Brian Coghlan and Brian Randell

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Charles Babbage is renowned worldwide as the designer of the first programmable mechanical computer, in 1834. Babbage's "Analytical Engine" was

designed to solve any equation by simply cranking a handle to turn cog wheels. Fifty cog wheels, each 2.5m in diameter, represented each number. Babbage envisaged a 1,000-number memory system, with 50,000 cog wheels, requiring a 150m frame to hold them all – longer than a full-size football pitch.

Nearly a century later and on the eve of the first World War, a remarkable Irishman, born in Skibbereen and then living in Dublin, published a very different design for a programmable mechanical computer. Percy Ludgate proposed using 21 notched

rods, held together in a shuttle, for each number.

By rotating two concentric rings containing sets of shuttles, a pair of numbers could be presented by the storage system to an arithmetic unit, which then mechanically sensed how far each set of rods protruded from their shuttle.

Most impressively of all, the Ludgate design was compact – about the size of a small fridge. But, as with Babbage's giant, Ludgate's machine has never been built.

Ludgate conducted his research in the evenings at his Drumcondra home, after work as a clerk to a corn merchant. He published his design in the Scientific Proceedings of the RDS in 1909. At an Edinburgh conference on the eve of the first World War, Ludgate distinguished between special-purpose machines, each restricted to solve just a limited set of equations, and Babbage's unique general-purpose design,

which could be programmed for any equation. Then, almost in passing, Ludgate mentions that he himself has developed a second design for a general-purpose programmable machine, and completely different from Babbage's design.

With the advent of the war and then Spanish flu, Ludgate's work was forgotten. He died in 1922 with complications after pneumonia.

His work was rediscovered in the 1970s by Brian Randell of Newcastle University and Brian Coghlan of Trinity College Dublin. They have researched the details of Ludgate's design, as well as his family genealogy.

The book provides a fascinating collection of their investigative work, as well as Ludgate's original papers. Percy Ludgate deserves his place in world history as a brilliant mathematician and engineer, and Ireland's first computer designer.