**Max Newman**

1897 – 1984

*A brief biography, based on that formerly displayed in the 'Hall of Fame' in Bletchley Park mansion.*

**Max Newman, a Cambridge mathematician, led the team at Bletchley Park that developed the mechanised processes used to break the Fish codes. The many devices that were developed, and the creation of statistical methods using the Robinson and Colossus machines, may be seen as heralding the birth of the digital age. After the war Newman, initiated the work leading to the first stored-programme computer at Manchester University in June 1948.**

Maxwell Herman Alexander Neumann was born in London on 7 February 1897. His father had emigrated from Germany in 1879 and later returned there. His English mother remained in England and Max changed his name to Newman in 1916. He went the City of London School and on to St John's College, Cambridge in 1915. He left Cambridge after his first year and, after some teaching and Army service, returned to complete the Mathematical Tripos with distinction in 1921. He gained a fellowship at St John's in 1923, his dissertation being about the use of 'symbolic machines' for making mathematical predictions. Between 1926 and 1942 he published over 20 ground-breaking papers on topology, and then on mathematical logic.

He became famous for his clear, stimulating lectures delivered entirely without notes. It was his posing of the question '*Could the provability of a mathematical statement be determined by the use of a mechanical process?'* that first led Alan Turing to answer the question in 1936 in his famous paper '*On Computable Numbers…'*.

Appointed a Fellow of the Royal Society in 1939, Newman continued to work with Turing on logical mathematics, producing a joint paper in May 1941. In recommending Newman for war work at Bletchley Park, Professor Patrick Blackett said: *'...He is one of the most intelligent people I know, being a first-class pure mathematician, an able philosopher, a good chess player and musician'*.

Max Newman started at Bletchley Park on 31 August 1942, finding himself trying to use hand methods to solve the Fish codes in the 'Testery', but becoming frustrated with the mental arithmetic involved. Turing had developed a statistical method for solving the wheel patterns and Max Newman now proposed how counters might be used to make this approach a practical proposition for the formidable Fish keys.

On 1 February 1943 Travis formally set up the 'Newmanry' for '*carrying out research on specially designed machines to bring to notice clues upon which a cryptographer can work'*. The Newmanry designed and built a variety of machines for breaking the Fish codes, the very top-level German codes, at first for finding the wheel start positions, and then extending the work to establishing wheel teeth patterns. Under his leadership the Heath Robinson machines were specified and built, using valve counters, leading on to the creation and use of the family of Robinson and Colossus machines, a computer-like electronic machine which first entered service in February 1944. They designed some 40 machines and ran many different algorithms.

Max Newman was a gentle, quiet, rather introspective man, and an excellent pianist, who could show real warmth and a quiet wit. The Newmanry grew to have 350 staff, 270 of them

Wrens. It was a most successful forward thinking, egalitarian team. The war was hardly over when Max Newman took the mathematics chair at Manchester University. There he launched a computer building project, the 'Baby', with a long-division routine provided by Turing. The Baby ran for the first time on 21 June 1948, the world's first general purpose stored-program computer. He retired in 1964, dying in 1984 in Cambridge where one of his two sons, William, has followed in the path his father pioneered by working in computer science research.