August 2019

The Life and Work of Beatrice ‘Tilly’ Shilling OBE PhD MSc CEng
an illustrated talk by Frankie Webb

Frankie began her talk by explaining that it was a throwaway remark, “well she only wanted a washer”, during a talk to her local U3A, that led to her research into the life and work of Beatrice ‘Tilly’ Shilling.

Born 8th March 1909 in Waterlooville, Hampshire, Beatrice Shilling was one of three sisters and always known within the family as Bea.

Aged 14 she got a two-stroke motorcycle and so began a lifelong fascination with speed (she could also strip down a rifle).

The Women’s Engineering Society provided the funding for an apprenticeship in electrical engineering in Devon when she was 17, and she went into digs in a YWCA hostel. She then spent two years working in a small power station. Her mother encouraged her ambitions, though her father was sceptical.

In 1929, she was one of just two women studying engineering at Victoria University, Manchester. Her BA was followed by an MSc. As it proved difficult to get a job, she became Assistant to the Lecturers at the University of Birmingham, where she learnt to use a lathe and welding equipment.

While there she joined the Motorcycle Club and took part in trials in the Lake District on her Norton.

This led to her taking her motorcycle, by train, to Brooklands, in 1934, where she won a newcomer’s race and, two years later, was only the second woman to win the Brooklands Gold Star for achieving 100mph; her actual speed was 106 mph.

In March 1936, she came to work as a Scientific Officer for the RAE at the old PO site, not the main site. She was to rewrite the manual for the Bristol Pegasus engine. In October, she moved to the Carburettor Section under W.C. Clothier, testing RAF carburettors.

Here she met George Naylor, a Mathematical Test Mechanic and fellow motorcyclist, whom she married in July 1938, and came to live at Carfield, (Number 10) Ashley Road, Farnborough. In 1955, the couple moved to Ravenswood, Prospect Road, since demolished.

Miss Shilling, as she continued to be known, was to enjoy a long and successful career at the RAE but her greatest achievement was in solving a serious fuel problem with the carburettors of the Rolls Royce Merlin engines in Hurricanes and Spitfires during the Battle of Britain. When these planes went into a dive, the negative g-force would flood their carburettors, causing the engine to stall. German fighters had fuel injection engines and did not have this problem, so could easily evade RAF fighters by flying a negative g-force manoeuvre; this gave the Germans a huge advantage. Beatrice’s solution was incredibly simple: the installation of a R.A.E. restrictor, basically a small washer, into the carburettor to prevent flooding. The device was affectionately known as ‘Miss Shilling’s orifice’, or the ‘Tilly orifice’, though it should be noted that nobody ever dared call Miss Shilling Tilly to her face!
George got into the RAF in 1941, with his wife’s help, and was a Lancaster bomber pilot. He returned to the RAE in March 1946, having won the DFC.

Meanwhile Miss Shilling had learnt to fly as part of the RAE’s Tech Flight Scheme and worked in the High Altitude Test Plant.

After the war, (1945) she moved to RAE supersonics division and thence to the guided weapons department. In 1952 she was transferred to the mechanical engineering department (later Engineering Physics) and stayed until 1969 when she retired, reluctantly, when she reached 60.

Among much else, she worked on solid fuel rockets, the Blue Streak nuclear missile, on aquaplaning, following the Munich air disaster, on overheating in the Weslake engine of Dan Gurney’s F1 car, and on the British Bobsled team’s sled ahead of the Grenoble Winter Olympics.

After the war both Beatrice and George began racing cars, often at the Goodwood track. She also raced her Lagonda at Silverstone, finally stopping in 1962. She and George did their own tuning up in the lounge of their home.

Beatrice Shilling died at the age of 81 on 18th November 1990 of spinal cancer.

**Recognition**

January 1948: Beatrice Shilling was awarded an OBE for her contribution to Aviation.

December 1969: Awarded an Honorary Doctorate by University of Surrey.

March 2019: The Beatrice Shilling Building – the Department of Electronic Engineering at Royal Holloway College, University of London opened.

2020: Beatrice Shilling Building for Engineering and Computing at Coventry University due to open.

8th March 2019: Mayor of Waterlooville unveiled a commemorative plaque at Waterlooville Library.

25th May 2019: The Farnborough Society’s blue plaque unveiled at 10 Ashley Road, Farnborough.

2011: J D Wetherspoon’s public house in Farnborough named The Tilly Shilling.

In closing, Frankie acknowledged her debt to Matthew Frendenberg’s biography of Beatrice Shilling *Negative Gravity*. She also expressed her delight in being asked by The Farnborough Society to perform the unveiling of their blue plaque in recognition of this incredible, formidable woman.