

## A. W. H. (BILL) PHILLIPS, MBE AND THE MONIAC

Alban William Housego Phillips (1914-1975) was one of New Zealand's most accomplished economists of the twentieth century. Born in New Zealand and brought up on a dairy farm, he moved to Australia soon after leaving school, and in 1937 went to China. He escaped ahead of the Japanese invasion that year, reached Britain via the Trans-Siberian Railway, and studied electrical engineering.

When the Second World War broke out Phillips joined the Royal Air Force and was posted to Singapore, later escaping to Java on a troopship as the island fell to Japanese forces. Here he was captured by the Japanese and made a POW. He quickly put his inventive skills to use in the camp, building a miniature radio hidden in a clog and creating an immersion element, run from the camp lighting, to boil water for hot drinks.

Phillips received an MBE for his wartime efforts. Awarded a New Zealand Forces scholarship, he attended the London School of Economics from 1946, studying first sociology and then economics.

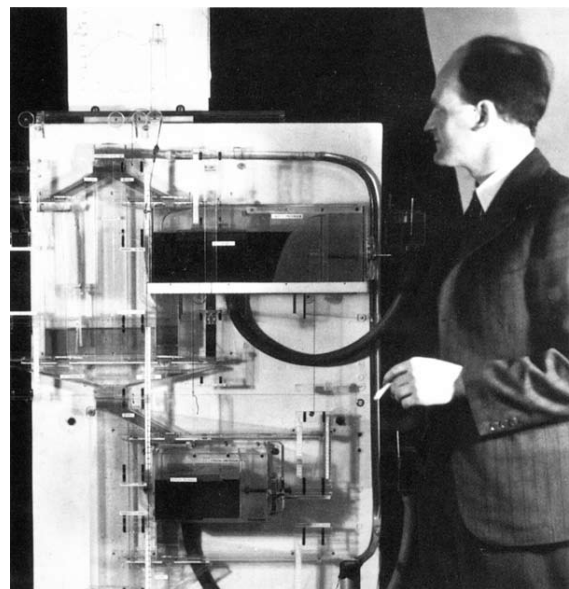
It was here that he developed a machine for demonstrating and calculating the workings of the macro-economy – the broad relationships between elements of the economy. Dubbed MONIAC, this has some claim to be the world's first macro-economic computer.

Phillips' most famous contribution to economic understanding remains the Phillips Curve, a relationship between unemployment and inflation which Phillips analysed during the 1950s. He published his conclusions in 1958, which were applied by Paul Samuelson and Robert Solow to the United States and became a significant cornerstone of economic analysis and thinking for the next thirty-odd years.

In 1967, Phillips moved to Australia and took up a position in the Australian National University, but he suffered a stroke two years later and retired to New Zealand, where he taught at the University of Auckland. He died in March 1975.

### ABOUT THE MONIAC

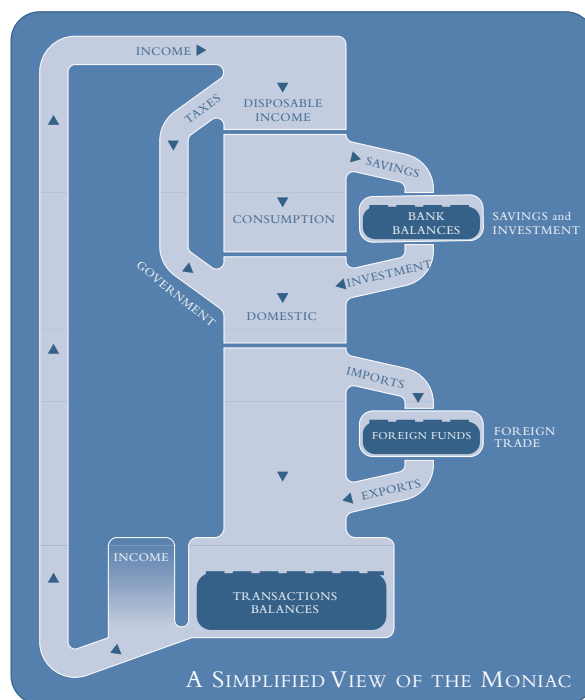
Bill Phillips built his prototype machine for around £400, including parts scavenged from a Lancaster bomber. The acronym MONIAC – 'Monetary National Income Analogue Computer' – was reputedly invented to echo the ENIAC digital computer then being developed in the United States. By contrast with those machines the MONIAC operated wholly on analogue principles. Around 14 were built.



*Above: Bill Phillips with a MONIAC.*  
(London School of Economics/LSE History Photographs/6/2/P)

One of a generation of twentieth century mechanical computing machines – others include the Differential Analyser and the Dreyer Fire Control table – MONIAC has some claim to being the world's first econometric computer. It could carry out calculations unable to be performed by any other computer at the time, and while other machines of its era used cogs, gears and sometimes Meccano parts, the MONIAC used water to model flows of money in a macro-economy. The linkages were based on Keynesian and classical economic principles, with various tanks representing households, business, government, exporting and importing sectors of the economy. Water pumped around the system could be measured as income, spending and GDP. The system was programmable, and experiments with fiscal policy, monetary policy and exchange rates could be carried out.

The MONIAC in the Reserve Bank Museum is the first production example, originally calibrated for the British economy, and is the only MONIAC known to be in working order in the southern hemisphere. It was donated to the New Zealand Institute of Economic Research by the London School of Economics in 1987 and restored to working order in 1991. It was refurbished again in 2003 before being displayed as part of a New Zealand display at the 50th Venice Biennale of Contemporary Art, a significant international exhibition. The Institute kindly loaned the MONIAC to the Reserve Bank Museum in 2006, and it underwent further restoration before being put on display in mid-2007.



Above: The MONIAC under refurbishment, 2006-07.

Right: The MONIAC.

