Herbert Simon (left) and Allen Newell (right)

Logic Theorist

The first *artificial intelligence program* (the first program specially engineered to mimic the problem solving skills of a human being) was created in 1955-56 by Herbert Simon, Allen Newell and John Shaw.

Herbert Alexander Simon (1916–2001), a Nobel Prize (in Economics) winner from 1978, was an American political scientist, economist, sociologist, and psychologist, whose research ranged across the fields of cognitive psychology, cognitive science, computer science, public administration, economics, management, philosophy of science, sociology, and political science. With almost a thousand highly cited publications, he was one of the most influential social scientists of the XX century.

Simon was consulting RAND Corporation in the early 1950s, and while seeing there a printer typing out a map, using ordinary letters, digits and punctuation as symbols, he realized that a machine that could manipulate symbols could just as well simulate decision making and possibly even the process of human thought.

The program that printed the map had been written by Allen Newell (1927-1992), a RAND Corporation scientist studying logistics and organization theory. For Newell, the decisive moment was in 1954 he watched a presentation on pattern matching and suddenly understood how the interaction of simple, programmable units could accomplish complex behavior, including the intelligent behavior of human beings.

Newell and Simon began to talk about the possibility of teaching machines to think. Their first project was a program that could prove mathematical theorems like the ones used in Russell and Whitehead's *Principia Mathematica*. Newell enlisted the help of a computer programmer from RAND, John Clifford Shaw (1922–1991), to develop the program.

In the summer of 1956, John McCarthy (LISP.html), Marvin Minsky and Claude Shannon (../thinkers/Shannon.html) organized a conference at Dartmouth College on the subject of what they called "artificial intelligence" (a term coined by McCarthy for the occasion). Simon and Newell proudly presented the group with their Logic Theorist and were somewhat surprised when the program received a lukewarm reception. Later on Simon confides: *They didn't want to hear from us, and we sure didn't want to hear from them: we had something to show them! ... In a way it was ironic because we already had done the first example of what they were after; and second, they didn't pay much attention to it.*

Cliff Shaw coded the Logic Theorist using an early version of IPL (Information Processing Language) programming language, running on a computer of RAND's Santa Monica research facility.

The Logic Theorist established the field of heuristic programming and soon proved 38 of the first 52 theorems in chapter 2 of the Principia Mathematica. The proof of one of the theorems was surprisingly more elegant than the proof produced laboriously by hand by Russell and Whitehead. Simon was able to show the new proof to Bertrand Russell himself who *responded with delight.*

A detailed description of the Logic Theorist can be found in a RAND memorandum (../../Library/Logic Theorist memorandum.pdf) from 1963.

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