PROBLEM-SOLVING

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Herbert A. Simon. *Models of My Life.* [N.p.:] Basic Books, 1991. Pp. xxix, 415. US$36.95.

"Dear Earl Russell: Mr. Newell and I thought you might like to see the enclosed report of our work in simulating certain human problem-solving processes with the aid of an electronic computer. We took as our subject matter Chapter 2 of *Principia* and sought to specify a program that would discover proofs for the theorems, similar to the proofs given

there." So wrote the forty-year-old Herbert Simon from the RAND Corporation in Santa Monica in 1956, unaware of the odd British protocol for addressing an earl but anxious to share the news of the first steps towards what Simon prefers to call "Artificial Intelligence" or AI. It was a major turning-point in his life as recounted in this autobiography. *Principia* might appear from a modern point of view to be a natural subject-matter since it represents the premier logical symbolization of a large part of human thought, and had been the subject of Kurt Gödel's famous 1931 paper on formally undecidable propositions that in turn stimulated Alan Turing's thoughts on the mind as a computer. Simon was then influenced by Turing's work to regard the computer as a symbol processor. But in spite of this, it is interesting to read, Simon and his RAND partner, Allen Newell, took as their first subjects the heuristics of solving geometrical problems and chess-playing. They turned to symbolic logic and *Principia* only after realizing that perception plays a significant role in the latter activities and proves more difficult to simulate than any other mental process.

Twenty-two years after his letters to Russell, Simon received the Nobel prize in economics for his theories on decision-making. In keeping with his "bounded rationality" approach to human behaviour, he pictures his own life story in terms of negotiating a maze, making decisions about which path to take and speculating on the paths not taken. The belief that life can be described as a heuristic search for the solution of an ill-structured problem is a suitable credo for AI. This echoes Russell's characterization of philosophy as the art of rational conjecture. But while Simon studies the process of making it through the maze, Russell is interested more in what the maze is for. It is no wonder that Simon, as an undergraduate at the University of Chicago, did not understand a word of a talk by a visiting philosopher by the name of Alfred North Whitehead, and apparently had no greater success in later years when he tried to read Whitehead's books. It is also not surprising that he appears not to notice the sardonic touch in Russell's responses to his two letters. To the first letter, quoted from above, Russell replied in part: "I am delighted to know that *Principia Mathematica* can now be done by machine." To the second, reporting on how JOHNNIAC and the Logic Theorist programme had discovered a beautifully succinct proof to replace one in *Principia*, Russell declared: "I am delighted by your example of the superiority of your machine to Whitehead and me."