Newell A & Simon H A. **Human problem solving.** Englewood Cliffs, NJ: Prentice-Hall, 1972. 920 p. [Carnegie-Mellon University, Pittsburgh, PA]

The human problem solver can be viewed as an information processing system that manipulates symbolic structures. Studies in three domains—elementary logic, chess, and puzzles —show this in combined experimental and theoretical detail. These are integrated into a general theory of human problem solving. [The *Social Sciences Citation Index*® (*SSCI*™) **indicates that this book has been cited over 360 times since 1972.]**

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"By general accord, a revolution happened in the scientific study of man in the mid-1950s, shifting the view to man as an active processor of symbolic information. The scope of that revolution is indicated by the names associated with it, who made pathbreaking, complementary, but distinct contributions: Broadbent, Chomsky, Miller, Newell and Simon, Tanner and Swets. Our work on the logic theory program for proving theorems in a heuristic manner on a computer (1956), followed by the work on the general problem solver (1958), was one strand of that revolution. It was associated with both the initiation of the field of artificial intelligence and the application of those ideas to human psychology. *Human Problem Solving* provided a full scale presentation of that work and the stream of research that followed (and has hardly yet abated).

"Little surprise is occasioned by the book being highly cited. The work itself has been the source of continued acts of recognition, for example: the American Psychological Association Scientific Contribution Award to Simon (1971) and the Association of Computing Machinery A.M. Turing Award jointly to Newell and Simon (1975).

"One interesting question, perhaps, is why it took 17 years to write the thing. We claimed (and had) a first outline in 1956. Another question might be why the thing is so long (920 pages). We have yet to find anyone who has really read it thoroughly from cover to cover. (A number of planted gems of wisdom have never caused the slightest ripple at the surface.)

"The answers to these two questions are intertwined. Artificial intelligence research differs stylistically from experimental psychology, raising questions of whether computer simulations are relevant to psychology, are metaphorical, or what. Early on we became convinced that we did not want to write the natural book, which would have been a melange of various artificial intelligence programs (some with data, some without), with relevant lessons for psychology. Thus the title became shorn of all references to computers to just *Human Problem Solving*, and many interesting programs (even those with data) were shucked aside. The book became severely limited (to problem solving, out of all cognitive functions), it became data heavy, and it became tightly integrated. Alas, it also became a treatise instead of a textbook. The aim was to make the case that *psychology* was being done, not something that could be pigeon-holed as associated with computers. We relied on protocol data on individuals, and it seemed necessary to include this in the book. The combination of all these new goals and the insistence on data throughout caused a complete reworking of the book. Thus the delay, thus the size.

"Whether the strategy we adopted was ultimately successful is hard to say. Pigeon-holing still went on. The book would have reached more widely if cast as a textbook. And on. But those are the woulds and coulds of another world than the one that happened."