The Imitation of Man by Machine

The view that machines will think as man does reveals misunderstanding of the nature of human thought.

Ulric Neisser

Popular opinion about "artificial intelligence" has passed through two phases. A generation ago, very few people believed that any machine could ever think as a man does. Now, however, it is widely held that this goal will be reached quite soon, perhaps in our lifetimes. It is my thesis that the second of these attitudes is nearly as unsophisticated as the first. Yesterday's skepticism was based on ignorance of the capacities of machines; today's confidence reflects a misunderstanding of the nature of thought.

There is no longer any doubt that computing machines can be programmed to behave in impressively intelligent ways. Marill (1) does not exaggerate in saying, "At present, we have, or are currently developing, machines that prove theorems, play games with sufficient skill to beat their inventors, recognize spoken words, translate text from one language to another, speak, read, write music, and learn to improve their own performance when given training." Nevertheless, I will argue that the procedures which bring about these results differ substantially from the processes which underlie the same (or other) activities in human beings. The grounds for this assertion are quite different from the "classical" reasons for skepticism about thinking machines, but the latter should be considered first. This amounts to reviewing the similarities between men and computers before stressing the differences.

First of all, it was formerly maintained that the actions of a mechanism would never be purposive or self-directed, whereas human behavior can be understood only in terms of goals and motives. Two counterexamples will be enough to show that this argument has become untenable. In the realm of action, it is difficult not to be impressed with the "homing" missile, which pursues its target tenaciously through every evasive action until it achieves its de-