reviews

Slaves to the machine
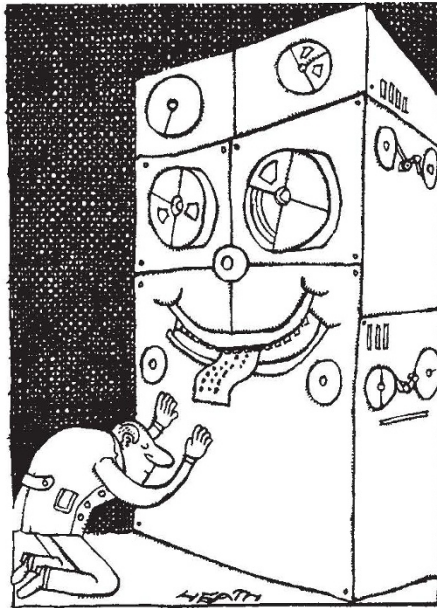
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Computer Power and Human Reason: From Judgment to Calculation. By Joseph Weizenbaum. Pp. xii + 300. (Freeman: San Fransico and Reading, January 1976.) $9.95; £5.95.

No computer centre is complete without one—a gaunt-faced hollow-eyed youth slaving over a hot teletype, working for hours on end long into the night and rarely pausing to satisfy his bodily needs. Should the time available to him on the machine begin to run out, his intensity of work rises to a feverish pitch: he lives dangerously, staking all on some irretrievable alteration of his program. Once off the machine, his life assumes a dull grey quality and is sustained only by sheaves of computer print-outs. He cannot wait to return to where the action is, and will sacrifice all social relations and obligations just to get back on to the system.

Who are these strange dedicated obsessive individuals? They are the new breed of slaves to the machine, the computer 'hackers'. And what are they doing? Almost invariably, they are developing some grandiose general all-purpose super-duper system that once completed will enable other less able programmers to write their own super-duper systems. Weizenbaum, in the most brilliant chapter of his provocative book, has delineated the psychology of computer hackers with a deep and convincing clinical expertise. He shows how the compulsive character of their work relates to a worldview similar to that of their second cousins, the gambling addicts. The computer provides the hacker with a universe, subtle but not malicious, over which he can exercise an absolute and god-like control. The programmer who is corrupted by this power is likely to develop great expertise, but he pays a price. His general all-purpose system is almost always an empty exercise in disembodied programming—that is to say, it fails to make intellectual contact with any other discipline.

The computer hacker is the central metaphor of Weizenbaum's book. He stands for the person who places a single-minded reliance on science as a source of understanding of life, who believes that man is nothing but a machine, and who cheerfully hands over responsibility for making decisions to computers. Weizenbaum's human-

istic scruples are particularly offended by the equation of human thinking with computational processes, and therefore by the new scientific discipline of Artificial Intelligence (AI).

The aim of AI is to construct intelligent machines, and its practitioners are notably devoted to composing computer programs that can perceive the world, or analyse two-dimensional representations of it, and that can conduct conversations in natural language. The first programs capable of rudimentary versions of such skills were written some years ago, but it soon became obvious that it was extremely difficult to test them against human performance. A cynic might say that it was for this reason that the goal of simulation was abandoned in favour of a science of the artificial. Weizenbaum, however, is no cynic; he advances a rather different argument against AI. Since some of his work laid the foundations for the new science, the impact of his book is comparable to that of an anti-vivisectionist tract written by a physiologist whose reputation rests on his operating skills.

What, in essence, is Weizenbaum's case? One can distill three main points from his book. First, certain tasks are too important to be handed over to a computer. It would be immoral as well as dangerous to make computers responsible for certain forms of psychotherapy. Such a proposal, relying on a program in fact devised by Weizenbaum, seems to have been the critical event that led to the present book. Second, artificial intelligencers suffer from hubris as an occupational disease. They are much given to promising to solve the riddle of the universe . . . tomorrow. "The only reason we have not yet succeeded in simulating every aspect of the real world is that we have been lacking a sufficiently powerful logical calculus. I am working on that problem." So spoke Professor John McCarthy in a perfect specimen of the megalomania that can grip the best of minds at the end of a long day's programming into the night. Weizenbaum, of course, considers that there are certain human propensities, such as the ability to feel desperate or to fall in love, that computers will never be able to display simply because they are not human beings. Third, AI programs are increasingly in danger of exceeding their progenitors' ability to understand them. It is confidently expected that scene analysis programs will soon exceed 1,000K in size, and no-one is likely to be able fully to understand or to communicate their mode of operation.

These are serious criticisms of AI, but even with the worst will in the world they hardly convict the discipline of triviality or immorality. Current computers cannot pick their noses, nor can they fall in love. There is every reason to suppose that they could be devised to carry out the former task, and no reason other than a humanist conscience for supposing that they could not be devised to do the latter. It *is* a frightening thought—almost as frightening as the idea that our ancestors were apes and that we live on an insignificant planet revolving round an insignificant star. Weizenbaum deserves our gratitude for writing an instructive book that can be read with profit by anyone from a humanist to a computer scientist. It should force us to think more carefully about what we set our computers to do. It should force the artificial intelligencers to reappraise their discipline. No serious practitioner is likely thereby to abandon his science. And the hackers, of course, know that life is nothing but an enormous program devised by the Great Programmer in the sky. □

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