

## Book Review

*Natural-Born Cyborgs: Minds, Technologies and the Future of Human Intelligence.*  
By Andy Clark. (Oxford University Press, Oxford, 2003), 229 pp., US\$ 26.00,  
ISBN 0-19-524866-5.

Andy Clark is one of the few professional philosophers worth reading. Unlike the vast majority of his colleagues, he writes clearly, about important issues, and is scientifically literate. His latest book, however, is a disappointment.

In *Natural-born Cyborgs*, Clark revisits philosophical territory that he has already mapped in great detail elsewhere. In earlier works, such as the excellent *Being There* (MIT Press, 1997), Clark constructed a robust defence of the idea that the mind supervenes on more than just the bare biological brain. According to this view, which sometimes goes by the name of ‘situated cognition’, tools need not always remain mere peripherals which the mind uses, but can actually come to form an integral part of the mind. As the psychologist Nicholas Humphrey has put it, a man with a hammer is not just handier—he is also in an important sense cleverer.

The problem with the new book is that it does not add anything to this already well-worked thesis except more examples. True, the examples themselves are fascinating, and provide a kind of whirlwind tour of some of the most exciting developments in cognitive technology from the past decade. But while brain–machine interfaces, multi-agent-based modelling and telerobotics may be interesting technologies in their own right, they add nothing to Clark’s earlier claims except by way of providing new and vivid illustrations. Given that Clark himself admits this at several points in the book, one is left wondering why he bothered to dress up the technology in the garb of philosophical analysis. After all, it is clearly the cool technology he discusses that really excites him, not the tired old claims about ‘embodiment’. You get the feeling that Clark really wishes he was an engineer, but feels constrained to make some kind of gesture towards his philosophical training.

The book also suffers from a peculiar inconsistency. Most of the new technologies Clark waxes lyrical about are novel interfaces that will allow us to interact with computers in ways that we find more ‘natural’ than the ‘narrow and demanding channels of keyboard and mouse’. These include ‘tangible user interfaces’ (TUIs), in which the user manipulates physical icons (‘phicons’), and other such devices that ‘take digital abstractions and data-flows and make them as solid and manipulable as rocks and stones’. Clark calls these new interfaces ‘transparent technologies’ because they allow the user to forget the tool and concentrate on the task at hand, unlike the ‘opaque technologies’ we currently have, such as desktop computers with keyboards that are ‘nasty, clumsy, fragile, and slow’.

Yet this is distinctly at odds with Clark's main thesis—namely, that we should embrace the power of our tools to alter profoundly our cognitive processes. By forcing our new tools to behave like our old ones, we nullify their revolutionary potential. If we really want to open ourselves up to the transformative effect of computers, we should surely adapt ourselves to their way of interacting, rather than forcing them to adapt to ours. Besides, anyone who has more than a superficial knowledge of computers knows that, paradoxically, all the non-textual 'user-friendly' interfaces tend to be much nastier, clumsier and slower than the good-old keyboard. Even a mouse is a slow, clumsy device when compared with a keyboard in the hands of a skilled typist. Just compare how long it takes for an experienced Windows user to locate files nested deep in sub-sub-directories with how long it takes a skilled Linux user to do the same. No contest. Text gets you there faster.

Another paradox looms large here. Tangible user interfaces and other 'transparent technologies' are actually the most 'opaque' when the user wants to modify them in some way. The extra layers added to the interface actually serve to make the alphanumeric code which underlies them more distant from the user and so harder to alter or understand. Textual interfaces, on the other hand, are transparent in that they permit the user direct access to the underlying code.

Lest this review seem wholly negative, I should mention that I enjoyed chapter 7 immensely. Here, Clark finally tempers his relentless optimism about the wonderful new wireless world of ubiquitous computing with some extremely perceptive comments on the potential dangers of the new technology. There is, for example, a fascinating, though brief, discussion of the threat that a world of smart tools poses for individual privacy. Clark speculates that only a tiny minority of computer-savvy people will stand any chance of maintaining their privacy in such a world.

Clark does not seem very good at judging the reliability of his peers or his sources. He cites brilliant thinkers like Dan Dennett alongside others like Kevin Warwick, as if each were of equal merit; and serious scientific sources figure in his notes (there is no bibliography) alongside postmodernist analyses of lesbian cyberpunk fiction. This left me a bit perplexed about in which section of the bookshop I would expect to find this book, but perhaps that is exactly the point. Clark's book is probably intended to be as promiscuous as the search engines it praises in transgressing conventional categories of discourse.

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