

WHAT THE INTERNET IS DOING TO OUR BRAINS

THE Nicholas Carr
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SHALLOWS

THE NEW YORK TIMES BESTSELLER

"A profoundly sharp thinker and writer. . . I have not only given this book to numerous friends, I actually changed my life in response to it." —Jonathan Safran Foer, *The Millions*

Epilogue

HUMAN ELEMENTS

As I was finishing this book late in 2009, I stumbled on a small story tucked away in the press. Edexcel, the largest educational testing firm in England, had announced it was introducing "artificial intelligence-based, automated marking of exam essays." The computerized grading system would "read and assess" the essays that British students write as part of a widely used test of language proficiency. A spokesman for Edexcel, which is a subsidiary of the media conglomerate Pearson, explained that the system "produced the accuracy of human markers while eliminating human elements such as tiredness and subjectivity," according to a report in the *Times Education Supplement*. A testing expert told the paper that the computerized evaluation of essays would be a mainstay of education in the future: "The uncertainty is 'when' not 'if.'"

How, I wondered, would the Edexcel software discern those rare students who break from the conventions of writing not because they're incompetent but because they have a special spark of brilliance? I knew the answer: it wouldn't. Computers, as Joseph Weizenbaum pointed out, follow rules; they don't make judgments. In place of subjectivity, they give us formula. The story revealed just

how prescient Weizenbaum had been when, decades ago, he warned that as we grow more accustomed to and dependent on our computers we will be tempted to entrust to them "tasks that demand wisdom." And once we do that, there will be no turning back. The software will become indispensable to those tasks.

The seductions of technology are hard to resist, and in our age of instant information the benefits of speed and efficiency can seem unalloyed, their desirability beyond debate. But I continue to hold out hope that we won't go gently into the future our computer engineers and software programmers are scripting for us. Even if we don't heed Weizenbaum's words, we owe it to ourselves to consider them, to be attentive to what we stand to lose. How sad it would be, particularly when it comes to the nurturing of our children's minds, if we were to accept without question the idea that "human elements" are outmoded and dispensable.

The Edexcel story also stirred, once again, my memory of that scene at the end of 2001. It's a scene that has haunted me ever since I first saw the film as a teenager back in the 1970s, in the midst of my analogue youth. What makes it so poignant, and so weird, is the computer's emotional response to the disassembly of its mind: its despair as one circuit after another goes dark, its childlike pleading with the astronaut—"I can feel it. I can feel it. I'm afraid"—and its final reversion to what can only be called a state of innocence. HAL's outpouring of feeling contrasts with the emotionlessness that characterizes the human figures in the film, who go about their business with an almost robotic efficiency. Their thoughts and actions feel scripted, as if they're following the steps of an algorithm. In the world of 2001, people have become so machinelike that the most human character turns out to be a machine. That's the essence of Kubrick's dark prophecy: as we come to rely on computers to mediate our understanding of the world, it is our own intelligence that flattens into artificial intelligence.

Afterword to the Paperback Edition

While researching and writing *The Shallows*, I sometimes felt as though I were paddling a very small and very empty rowboat against a very strong tide. That impression, I was happy to discover when the first edition of the book appeared in early 2010, was mistaken. The boat may have been small, but I was not the only one manning the oars. Two other books, published at about the same time, raised serious concerns about the way the Internet is shaping, and perhaps warping, our intellectual and social lives. *You Are Not a Gadget*, by the computer scientist Jaron Lanier, argued that the way Web sites and social networks are designed might be subverting our creativity and even our humanity. *Hamlet's BlackBerry*, by the journalist William Powers, looked at how the constant buzz of digital gadgets can drown out life's quieter pleasures. More such books followed, with titles like *Overconnected* and *The Net Delusion*, and at the start of 2011 the MIT psychologist Sherry Turkle published *Alone Together*, a deeply researched, deeply disturbing examination of how the communication technologies intended to bring us together may be pushing us apart.

A backlash against the Net, it seems, is under way, and it is by no

means limited to the scribbles of disillusioned middle-age authors. Software programmers have begun writing applications intended to shield us from the Net's distractions. Programs like Freedom and Anti-Social automatically switch off your Internet connection or restrict your access to social networks for hours at a time, allowing you to complete a job or follow a train of thought without interruption. And new browser plug-ins, like Readability and Instapaper, extract online text from the Web's clutter, lending to the screen a bit of the tranquility that characterizes the printed page. There's something funny, and a little sad, about looking to software to curb our technological appetites—to give us a virtual backbone—and it remains to be seen how broadly these apps will come to be used. Nevertheless, their existence testifies to a growing sense of unease about the Net's effects. People seem to be looking for ways to loosen technology's grip on their lives and thoughts.

I saw signs of this backlash in the correspondence I received from readers of *The Shallows*. (Most of the notes arrived via e-mail, though I do have a sizable stack of typed and handwritten letters on my desk.) Dozens of people wrote to share their own stories of how the Web has scattered their attention, parched their memory, or turned them into compulsive nibblers of info-snacks. I was particularly struck by the large number of notes that came from young people—high-schoolers, college kids, twentysomethings. They fear that constant connectivity may be constricting rather than expanding their horizons. Some of their stories are poignant. One college senior sent me a long e-mail describing how he has struggled “with a moderate to major form of Internet addiction” since the third grade. “I am unable to focus on anything in a deep or detailed manner,” he wrote. “The only thing my mind can do, indeed the only thing it wants to do, is plug back into that distracted frenzied blitz of online information.” He is drawn back into the Web even though he knows that “the happiest and most fulfilled times of my life have all involved a prolonged separation from the Internet.”

I've always been suspicious of those who seek to describe the

effects of digital media in generational terms, drawing sharp contrasts between young “Internet natives” and old “Internet immigrants.” Such distinctions strike me as misleading, if not specious. If you look at statistics on Web use over the past two decades, you see that the average adult has spent more time online than the average kid. Parents are as besotted with their BlackBerry as their children are with their Xboxes. And the idea that those who grow up peering at screens will somehow manage to avoid the cognitive toll exacted by multitasking and persistent interruptions is a fantasy contradicted by neuroscientific research. All of us, young and old alike, have similar neurons and synapses, and our brains are affected in similar ways by the media we use.

Net culture isn't youth culture; it's mainstream culture. And my guess is that if the incipient Net backlash expands into a broad movement, the people leading it will be not the nostalgic old but the idealistic young. It's worth remembering that one of the original targets of the sixties counterculture was the then-new mainframe computer, which seemed to be reducing human beings to strings of numbers. Campus protesters didn't just burn draft cards; they folded, spindled, and mutilated IBM punch cards. “Punch cards, used for class registration, were first and foremost a symbol of uniformity,” the historian Steven Lubar has written, and “they became the symbolic point of attack.”

Those times, and those attitudes, feel like ancient history now. As computers shrank, they became a lot less threatening. Eager for their assistance, we welcomed them into our homes and then into our pockets. But the young are still the enemies of uniformity, and the Internet, as it extends its reach into all the nooks and crannies of our days, is looking more and more like an enormous conduit of conventionality. What are Facebook and Google but giant institutions, arms of the new Establishment? What are smartphones if not high-tech leashes? Today, online databases hold more information about us than could fit on a mile-high stack of punch cards. Some kind of rebellion seems in order.

Of course, in conjuring up a big anti-Net backlash, I may be indulging in a fantasy of my own. After all, the Internet tide continues to swell. In the months since I completed *The Shallows*, Facebook membership has doubled from 300 million to 600 million; the number of text messages processed every month by the typical American teen has jumped from 2,300 to 3,300; sales of e-readers, tablets, and smartphones have skyrocketed; app stores have proliferated; elementary schools have rushed to put iPads in their students' hands; and the time we spend in front of screens has continued its seemingly inexorable rise. We may be wary of what our devices are doing to us, but we're using them more than ever. And yet, history tells us, it's only against such powerful cultural currents that countercultural movements take shape.

As I said, it's a small boat. But there's still plenty of room inside. Feel free to grab an oar.

—Boulder, Colorado
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