

UPDATED WITH A NEW AFTERWORD

WHAT THE  
INTERNET  
IS DOING TO  
OUR BRAINS



THE

“This is a book to  
shake up the world.”

—ANN PATCHETT

SHALLOWS

THE *NEW YORK TIMES* BESTSELLER

NICHOLAS CARR

# THE SHALLOWS

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*What the Internet Is Doing  
to Our Brains*

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NICHOLAS CARR



W.W. NORTON & COMPANY  
*Independent Publishers Since 1923*

*to my mother*

*and in memory of my father*

# *Contents*

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*Introduction to the Second Edition*

*Prologue*

THE WATCHDOG AND THE THIEF

*One*

HAL AND ME

*Two*

THE VITAL PATHS

a digression

*on what the brain thinks about when it thinks about itself*

*Three*

TOOLS OF THE MIND

*Four*

THE DEEPENING PAGE

a digression

*on lee de forest and his amazing audion*

*Five*

A MEDIUM OF THE MOST GENERAL NATURE

*Six*

THE VERY IMAGE OF A BOOK

*Seven*

THE JUGGLER'S BRAIN

a digression

*on the buoyancy of IQ scores*

*Eight*

THE CHURCH OF GOOGLE

*Nine*

SEARCH, MEMORY

a digression

*on the writing of this book*

*Ten*

A THING LIKE ME

*Epilogue*

HUMAN ELEMENTS

*Afterword to the Second Edition*

THE MOST INTERESTING THING IN THE WORLD

*Notes*

*Further Reading*

*Acknowledgments*

*Index*

## *Introduction To the Second Edition*

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Welcome to *The Shallows*. When I wrote this book ten years ago, the prevailing view of the Internet was sunny, often ecstatically so. We reveled in the seemingly infinite bounties of the online world. We admired the wizards of Silicon Valley and trusted them to act in our best interest. We took it on faith that computer hardware and software would make our lives better, our minds sharper. In a 2010 Pew Research survey of some 400 prominent thinkers, more than eighty percent agreed that “by 2020, people’s use of the Internet [will have] enhanced human intelligence; as people are allowed unprecedented access to more information, they become smarter and make better choices.”<sup>1</sup>

The year 2020 has arrived. We’re not smarter. We’re not making better choices.

*The Shallows* explains why we were mistaken about the Net. When it comes to the quality of our thoughts and judgments, the amount of information a communication medium supplies is less important than the way the medium presents the information and the way, in turn, our minds take it in. The brain’s capacity is not unlimited. The passageway from perception to understanding is narrow. It takes patience and concentration to evaluate new information—to gauge its accuracy, to weigh its relevance and worth, to put it into context—and the Internet, by design, subverts patience and concentration. When the brain is overloaded by stimuli, as it usually is when we’re peering into a network-connected computer screen, attention splinters, thinking becomes superficial, and memory suffers. We become

less reflective and more impulsive. Far from enhancing human intelligence, I argue, the Internet degrades it.

Much has changed in the decade since *The Shallows* came out. Smartphones have become our constant companions. Social media has insinuated itself into everything we do. The dark things that can happen when everyone's connected have happened. Our faith in Silicon Valley has been broken, yet the big Internet companies wield more power than ever. This tenth-anniversary edition of *The Shallows* takes stock of the changes. It includes an extensive new afterword in which I examine the cognitive and cultural consequences of the rise of smartphones and social media, drawing on the large body of new research that has appeared since 2010. I have left the original text of the book largely unchanged. I'm biased, but I think *The Shallows* has aged well. To my eyes, it's more relevant today than it was ten years ago. I hope you find it worthy of your attention.

—NICHOLAS CARR, MASSACHUSETTS, 2020



And in the midst of this wide quietness  
A rosy sanctuary will I dress  
With the wreath'd trellis of a working brain . . .

— JOHN KEATS, “Ode to Psyche”

# THE SHALLOWS

## *Prologue*

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### **THE WATCHDOG AND THE THIEF**

In 1964, just as the Beatles were launching their invasion of America's airwaves, Marshall McLuhan published *Understanding Media: The Extensions of Man* and transformed himself from an obscure academic into a star. Oracular, gnomic, and mind-bending, the book was a perfect product of the sixties, that now-distant decade of acid trips and moon shots, inner and outer voyaging. *Understanding Media* was at heart a prophecy, and what it prophesied was the dissolution of the linear mind. McLuhan declared that the "electric media" of the twentieth century—telephone, radio, movies, television—were breaking the tyranny of text over our thoughts and senses. Our isolated, fragmented selves, locked for centuries in the private reading of printed pages, were becoming whole again, merging into the global equivalent of a tribal village. We were approaching "the technological simulation of consciousness, when the creative process of knowing will be collectively and corporately extended to the whole of human society."<sup>1</sup>

Even at the crest of its fame, *Understanding Media* was a book more talked about than read. Today it has become a cultural relic, consigned to media studies courses in universities. But McLuhan, as much a showman as a scholar, was a master at turning phrases, and one of them, sprung from the pages of the book, lives on as a popular saying: "The medium is the message." What's been forgotten in our repetition of this enigmatic

aphorism is that McLuhan was not just acknowledging, and celebrating, the transformative power of new communication technologies. He was also sounding a warning about the threat the power poses—and the risk of being oblivious to that threat. “The electric technology is within the gates,” he wrote, “and we are numb, deaf, blind and mute about its encounter with the Gutenberg technology, on and through which the American way of life was formed.”<sup>2</sup>

McLuhan understood that whenever a new medium comes along, people naturally get caught up in the information—the “content”—it carries. They care about the news in the newspaper, the music on the radio, the shows on the TV, the words spoken by the person on the far end of the phone line. The technology of the medium, however astonishing it may be, disappears behind whatever flows through it—facts, entertainment, instruction, conversation. When people start debating (as they always do) whether the medium’s effects are good or bad, it’s the content they wrestle over. Enthusiasts celebrate it; skeptics decry it. The terms of the argument have been pretty much the same for every new informational medium, going back at least to the books that came off Gutenberg’s press. Enthusiasts, with good reason, praise the torrent of new content that the technology uncorks, seeing it as signaling a “democratization” of culture. Skeptics, with equally good reason, condemn the crassness of the content, viewing it as signaling a “dumbing down” of culture. One side’s abundant Eden is the other’s vast wasteland.

The Internet is the latest medium to spur this debate. The clash between Net enthusiasts and Net skeptics, carried out over the last two decades through dozens of books and articles and thousands of blog posts, video clips, and podcasts, has become as polarized as ever, with the former heralding a new golden age of access and participation and the latter bemoaning a new dark age of mediocrity and narcissism. The debate has been important—content does matter—but because it hinges on personal ideology and taste, it has gone down a cul-de-sac. The views have become extreme, the attacks personal. “Luddite!” sneers the enthusiast. “Philistine!” scoffs the skeptic. “Cassandra!” “Pollyanna!”

What both enthusiast and skeptic miss is what McLuhan saw: that in the long run a medium’s content matters less than the medium itself in influencing how we think and act. As our window onto the world, and onto

ourselves, a popular medium molds what we see and how we see it—and eventually, if we use it enough, it changes who we are, as individuals and as a society. “The effects of technology do not occur at the level of opinions or concepts,” wrote McLuhan. Rather, they alter “patterns of perception steadily and without any resistance.”<sup>3</sup> The showman exaggerates to make his point, but the point stands. Media work their magic, or their mischief, on the nervous system itself.

Our focus on a medium’s content can blind us to these deep effects. We’re too busy being dazzled or disturbed by the programming to notice what’s going on inside our heads. In the end, we come to pretend that the technology itself doesn’t matter. It’s how we use it that matters, we tell ourselves. The implication, comforting in its hubris, is that we’re in control. The technology is just a tool, inert until we pick it up and inert again once we set it aside.

McLuhan quoted a self-serving pronouncement by David Sarnoff, the media mogul who pioneered radio at RCA and television at NBC. In a speech at the University of Notre Dame in 1955, Sarnoff dismissed criticism of the mass media on which he had built his empire and his fortune. He turned the blame for any ill effects away from the technologies and onto the listeners and viewers: “We are too prone to make technological instruments the scapegoats for the sins of those who wield them. The products of modern science are not in themselves good or bad; it is the way they are used that determines their value.” McLuhan scoffed at the idea, chiding Sarnoff for speaking with “the voice of the current somnambulism.”<sup>4</sup> Every new medium, McLuhan understood, changes us. “Our conventional response to all media, namely that it is how they are used that counts, is the numb stance of the technological idiot,” he wrote. The content of a medium is just “the juicy piece of meat carried by the burglar to distract the watchdog of the mind.”<sup>5</sup>

Not even McLuhan could have foreseen the feast that the Internet has laid before us: one course after another, each juicier than the last, with hardly a moment to catch our breath between bites. As networked computers have shrunk to the size of iPhones and Androids, the feast has become a movable one, available anytime, anywhere. It’s in our home, our office, our car, our classroom, our purse, our pocket. Even people who are

wary of the Net's ever-expanding influence rarely allow their concerns to get in the way of their use and enjoyment of the technology. The movie critic David Thomson once observed that "doubts can be rendered feeble in the face of the certainty of the medium."<sup>6</sup> He was talking about the cinema and how it projects its sensations and sensibilities not only onto the movie screen but onto us, the engrossed and compliant audience. His comment applies with even greater force to the Net. The computer screen bulldozes our doubts with its bounties and conveniences. It is so much our servant that it would seem churlish to notice that it is also our master.

## One

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### HAL AND ME

“Dave, stop. Stop, will you? Stop, Dave. Will you stop?” So the supercomputer HAL pleads with the implacable astronaut Dave Bowman in a famous and weirdly poignant scene toward the end of Stanley Kubrick’s *2001: A Space Odyssey*. Bowman, having nearly been sent to a deep-space death by the malfunctioning machine, is calmly, coldly disconnecting the memory circuits that control its artificial brain. “Dave, my mind is going,” HAL says, forlornly. “I can feel it. I can feel it.”

I can feel it too. Over the last few years I’ve had an uncomfortable sense that someone, or something, has been tinkering with my brain, remapping the neural circuitry, reprogramming the memory. My mind isn’t going—so far as I can tell—but it’s changing. I’m not thinking the way I used to think. I feel it most strongly when I’m reading. I used to find it easy to immerse myself in a book or a lengthy article. My mind would get caught up in the twists of the narrative or the turns of the argument, and I’d spend hours strolling through long stretches of prose. That’s rarely the case anymore. Now my concentration starts to drift after a page or two. I get fidgety, lose the thread, begin looking for something else to do. I feel like I’m always dragging my wayward brain back to the text. The deep reading that used to come naturally has become a struggle.

I think I know what’s going on. For well over a decade now, I’ve been spending a lot of time online, searching and surfing and sometimes adding

to the great databases of the Internet. The Web's been a godsend to me as a writer. Research that once required days in the stacks or periodical rooms of libraries can now be done in minutes. A few Google searches, some quick clicks on hyperlinks, and I've got the telltale fact or the pithy quote I was after. I couldn't begin to tally the hours or the gallons of gasoline the Net has saved me. I do most of my banking and a lot of my shopping online. I use my browser to pay my bills, schedule my appointments, book flights and hotel rooms, renew my driver's license, send invitations and greeting cards. Even when I'm not working, I'm as likely as not to be foraging in the Web's data thickets—reading and writing e-mails, scanning headlines and blog posts, following Facebook updates, watching video streams, downloading music, or just tripping lightly from link to link to link.

The Net has become my all-purpose medium, the conduit for most of the information that flows through my eyes and ears and into my mind. The advantages of having immediate access to such an incredibly rich and easily searched store of data are many, and they've been widely described and duly applauded. "Google," says Heather Pringle, a writer with *Archaeology* magazine, "is an astonishing boon to humanity, gathering up and concentrating information and ideas that were once scattered so broadly around the world that hardly anyone could profit from them."<sup>1</sup> Observes *Wired's* Clive Thompson, "The perfect recall of silicon memory can be an enormous boon to thinking."<sup>2</sup>

The boons are real. But they come at a price. As McLuhan suggested, media aren't just channels of information. They supply the stuff of thought, but they also shape the process of thought. And what the Net seems to be doing is chipping away my capacity for concentration and contemplation. Whether I'm online or not, my mind now expects to take in information the way the Net distributes it: in a swiftly moving stream of particles. Once I was a scuba diver in the sea of words. Now I zip along the surface like a guy on a Jet Ski.

Maybe I'm an aberration, an outlier. But it doesn't seem that way. When I mention my troubles with reading to friends, many say they're suffering from similar afflictions. The more they use the Web, the more they have to fight to stay focused on long pieces of writing. Some worry they're becoming chronic scatterbrains. Several of the bloggers I follow have also mentioned the phenomenon. Scott Karp, who used to work for a magazine



and now writes a blog about online media, confesses that he has stopped reading books altogether. “I was a lit major in college, and used to be [a] voracious book reader,” he writes. “What happened?” He speculates on the answer: “What if I do all my reading on the web not so much because the way I read has changed, i.e. I’m just seeking convenience, but because the way I THINK has changed?”<sup>3</sup>

Bruce Friedman, who blogs about the use of computers in medicine, has also described how the Internet is altering his mental habits. “I now have almost totally lost the ability to read and absorb a longish article on the web or in print,” he says.<sup>4</sup> A pathologist on the faculty of the University of Michigan Medical School, Friedman elaborated on his comment in a telephone conversation with me. His thinking, he said, has taken on a “staccato” quality, reflecting the way he quickly scans short passages of text from many sources online. “I can’t read *War and Peace* anymore,” he admitted. “I’ve lost the ability to do that. Even a blog post of more than three or four paragraphs is too much to absorb. I skim it.”

Philip Davis, a doctoral student in communication at Cornell who contributes to the Society for Scholarly Publishing’s blog, recalls a time back in the 1990s when he showed a friend how to use a Web browser. He says he was “astonished” and “even irritated” when the woman paused to read the text on the sites she stumbled upon. “You’re not supposed to read web pages, just click on the hypertexted words!” he scolded her. Now, Davis writes, “I read a lot—or at least I should be reading a lot—only I don’t. I skim. I scroll. I have very little patience for long, drawn-out, nuanced arguments, even though I accuse others of painting the world too simply.”<sup>5</sup>

Karp, Friedman, and Davis—all well-educated men with a keenness for writing—seem fairly sanguine about the decay of their faculties for reading and concentrating. All things considered, they say, the benefits they get from using the Net—quick access to loads of information, potent searching and filtering tools, an easy way to share their opinions with a small but interested audience—make up for the loss of their ability to sit still and turn the pages of a book or a magazine. Friedman told me, in an e-mail, that he’s “never been more creative” than he has been recently, and he attributes that “to my blog and the ability to review/scan ‘tons’ of information on the

web.” Karp has come to believe that reading lots of short, linked snippets online is a more efficient way to expand his mind than reading “250-page books,” though, he says, “we can’t yet recognize the superiority of this networked thinking process because we’re measuring it against our old linear thought process.”<sup>6</sup> Muses Davis, “The Internet may have made me a less patient reader, but I think that in many ways, it has made me smarter. More connections to documents, artifacts, and people means more external influences on my thinking and thus on my writing.”<sup>7</sup> All three know they’ve sacrificed something important, but they wouldn’t go back to the way things used to be.

For some people, the very idea of reading a book has come to seem old-fashioned, maybe even a little silly—like sewing your own shirts or butchering your own meat. “I don’t read books,” says Joe O’Shea, a former president of the student body at Florida State University and a 2008 recipient of a Rhodes Scholarship. “I go to Google, and I can absorb relevant information quickly.” O’Shea, a philosophy major, doesn’t see any reason to plow through chapters of text when it takes but a minute or two to cherry-pick the pertinent passages using Google Book Search. “Sitting down and going through a book from cover to cover doesn’t make sense,” he says. “It’s not a good use of my time, as I can get all the information I need faster through the Web.” As soon as you learn to be “a skilled hunter” online, he argues, books become superfluous.<sup>8</sup>

O’Shea seems more the rule than the exception. In 2008, a research and consulting outfit called nGenera released a study of the effects of Internet use on the young. The company interviewed some six thousand members of what it calls “Generation Net”—kids who have grown up using the Web. “Digital immersion,” wrote the lead researcher, “has even affected the way they absorb information. They don’t necessarily read a page from left to right and from top to bottom. They might instead skip around, scanning for pertinent information of interest.”<sup>9</sup> In a talk at a recent Phi Beta Kappa meeting, Duke University professor Katherine Hayles confessed, “I can’t get my students to read whole books anymore.”<sup>10</sup> Hayles teaches English; the students she’s talking about are students of literature.

People use the Internet in all sorts of ways. Some are eager, even compulsive adopters of the latest technologies. They keep accounts with a

dozen or more online services and subscribe to scores of information feeds. They post and they comment, they text and they tweet. Others don't much care about being on the cutting edge but nevertheless find themselves online most of the time, tapping away at their desktop, their laptop, or their phone. The Net has become essential to their work, school, or social lives, and often to all three. Still others log on only a few times a day—to check their e-mail, follow a story in the news, research a topic of interest, or do some shopping. And there are, of course, many people who don't use the Internet at all, either because they can't afford to or because they don't want to. What's clear, though, is that for society as a whole the Net has become, in just the twenty years since the software programmer Tim Berners-Lee wrote the code for the World Wide Web, the communication and information medium of choice. The scope of its use is unprecedented, even by the standards of the mass media of the twentieth century. The scope of its influence is equally broad. By choice or necessity, we've embraced the Net's uniquely rapid-fire mode of collecting and dispensing information.

We seem to have arrived, as McLuhan said we would, at an important juncture in our intellectual and cultural history, a moment of transition between two very different modes of thinking. What we're trading away in return for the riches of the Net—and only a curmudgeon would refuse to see the riches—is what Karp calls “our old linear thought process.” Calm, focused, undistracted, the linear mind is being pushed aside by a new kind of mind that wants and needs to take in and dole out information in short, disjointed, often overlapping bursts—the faster, the better. John Battelle, a onetime magazine editor and journalism professor who now runs an online advertising syndicate, has described the intellectual frisson he experiences when skittering across Web pages: “When I am performing bricolage in real time over the course of hours, I am ‘feeling’ my brain light up, I [am] ‘feeling’ like I’m getting smarter.”<sup>11</sup> Most of us have experienced similar sensations while online. The feelings are intoxicating—so much so that they can distract us from the Net's deeper cognitive consequences.

For the last five centuries, ever since Gutenberg's printing press made book reading a popular pursuit, the linear, literary mind has been at the center of art, science, and society. As supple as it is subtle, it's been the imaginative mind of the Renaissance, the rational mind of the

Enlightenment, the inventive mind of the Industrial Revolution, even the subversive mind of Modernism. It may soon be yesterday's mind.

THE HAL 9000 computer was born, or “made operational,” as HAL himself humbly put it, on January 12, 1992, in a mythical computer plant in Urbana, Illinois. I was born almost exactly thirty-three years earlier, in January of 1959, in another midwestern city, Cincinnati, Ohio. My life, like the lives of most Baby Boomers and Generation Xers, has unfolded like a two-act play. It opened with Analogue Youth and then, after a quick but thorough shuffling of the props, it entered Digital Adulthood.

When I summon up images from my early years, they seem at once comforting and alien, like stills from a G-rated David Lynch film. There's the bulky mustard-yellow telephone affixed to the wall of our kitchen, with its rotary dial and long, coiled cord. There's my dad fiddling with the rabbit ears on top of the TV, vainly trying to get rid of the snow obscuring the Reds game. There's the rolled-up, dew-dampened morning newspaper lying in our gravel driveway. There's the hi-fi console in the living room, a few record jackets and dust sleeves (some from my older siblings' Beatles albums) scattered on the carpet around it. And downstairs, in the musty basement family room, there are the books on the bookshelves—lots of books—with their many-colored spines, each bearing a title and the name of a writer.

In 1977, the year *Star Wars* came out and the Apple Computer company was incorporated, I headed to New Hampshire to attend Dartmouth College. I didn't know it when I applied, but Dartmouth had long been a leader in academic computing, playing a pivotal role in making the power of data-processing machines easily available to students and teachers. The college's president, John Kemeny, was a respected computer scientist who in 1972 had written an influential book called *Man and the Computer*. He had also, a decade before that, been one of the inventors of BASIC, the first programming language to use common words and everyday syntax. Near the center of the school's grounds, just behind the neo-Georgian Baker Library with its soaring bell tower, squatted the single-story Kiewit Computation Center, a drab, vaguely futuristic concrete building that housed the school's pair of General Electric GE-635 mainframe computers. The mainframes ran the groundbreaking Dartmouth Time-Sharing System,