

Tech Talks: Tech for Seniors

The Shallows (2011)

by Nicholas Carr

Center for Learning in Retirement - Fall 2017

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Introduction

- [Nicholas G. Carr](#) (born 1959) is an American writer who has published books and articles on technology, business, and culture. His book *The Shallows: What the Internet Is Doing to Our Brains* was a finalist for the 2011 Pulitzer Prize in General Nonfiction.



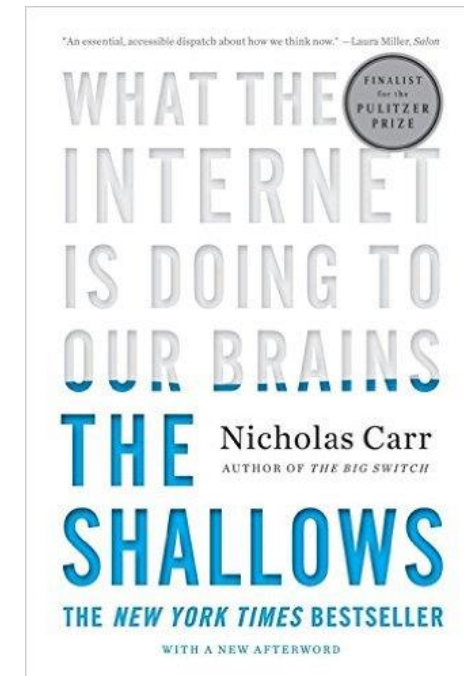
- [Does IT Matter?](#) '04
- [The Big Switch: Rewiring the World, from Edison to Google](#) '08
- [The Shallows: What the Internet Is Doing to Our Brains](#) '11
- [The Glass Cage: How Our Computers Are Changing Us](#) '14
- [Utopia Is Creepy](#) '16
 - [Is Google Making Us Stupid](#) (*The Atlantic*, '08)
 - [The Web Shatters Focus, Rewires Brains](#) (*Wired*, '10)

['The Shallows': This Is Your Brain Online Audio Interview on NPR](#) '10

[The Shallows - What the Internet Is Doing to Our Brains](#), 2010

[The Neuroscience of Internet Addiction](#), 2011

[Nicholas Carr: Is the Internet Making Us Stupid?](#), 2011



Topic

- The Shallows (2011)
 - “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.” p. 224
- Other books like this:
 - [You Are Not a Gadget](#) – Lanier (2011)
 - [Hamlet’s Blackberry](#) – Powers (2011)
 - [Alone Together](#) – Turkle (2011)
 - [Overconnected](#) – Davidow (2012)
 - [The Net Delusion](#) – Morozov (2012)

Summary

- The Shallows

- Marshall McLuhan (*Understanding Media: The Extensions of Man*)

“Our conventional response to all media, namely that it is how they are used that counts, is the numb stance of the technological idiot.” The content of the medium is just “the juicy piece of meat carried by the burglar to distract the watchdog of the mind.”

- 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.

Overview

- The Shallows
 - Networked vs. Linear Thought p8
 - Neuroplasty p34, 116
 - Invention, and Intellectual Ethic p45
 - Post-literacy p112, 119
 - The Juggler's Brain p122
 - Multitasking p141, 133
 - Know less p180, 193
 - The Brain p186
 - Pancake People p196
 - ART p219

Networked vs. Linear Thought

- Kids don't read books anymore. Reading a book is 'old-fashioned'?
- Digital 'immersion' IS effecting the way we absorb information.
- The net is important to our work, school , and social lives.
- Our calm, focused, undistracted, linear mind is being pushed aside by a mind that needs to take in information in short, disjointed, often overlapping bursts.
- Our imaginative, rational, inventive and sometimes subversive linear, literary mind may soon be yesterday's mind.

Neuroplasticity

- Michael Greenberg – Our neurological system, “with its branches and transmitters and ingeniously spanned gaps, has an improvised quality that seems to mirror the unpredictability of thought itself.” It’s “an ephemeral place that changes as our experience changes.”
- Good news: even ‘old’ brains can be taught new tricks!
- Bad news: determinism – circuits strengthen through repetition, which transforms that activity into habit (paradox of neuroplasticity)
- Routine activities are carried out more quickly and efficiently, while unused circuits are pruned away – plastic not equal to elastic
- Intellectual decay is inherent in the malleability of our brains...

Invention, and Intellectual Ethic

- The intellectual ‘ethic’ of a technology is rarely recognized by its inventor(s), and users are oblivious... (clock example), yet the intellectual ethic has the most profound effect on us!
- Thorstein Veblen: technological determinism – an autonomous force outside man’s control.
- David Sarnoff: ‘tools’ are natural artifacts, entirely subservient to the conscious wishes of their users – instrumentalism. (Amish example)
- Agreement: technological advances often mark turning points in history.

Post-literacy

- Our old literary habits “were just a side effect of living in an environment of impoverished access.” Now the Net has granted us abundant “access”. Now we can lay those tired habit aside. – Clay Shirky
- The death of ‘deep reading’ – there’s a fundamental shift in society’s attitude toward intellectual achievement.
- The Net is programmed to ‘scatter’ our attention.
- Multitasking is made easy with modern operating systems/applications.
- In the choices we have made... we have rejected the intellectual ‘tradition’ of solitary, single-minded concentration – the book ethic.

The Juggler's Brain

- The Net's cacophony of stimuli short-circuits both conscious and unconscious thought, preventing our minds from thinking deeply or creatively.
- Michael Merzenich: "When culture drives changes in the ways that we engage our brains, it creates different brains" – heavy use of the Internet and online tools has 'neurological consequences'.
- Working memory – cognitive load – when overloaded, distractions become more distracting.
- How it works: Working memory forms the contents of our consciousness. Contents of long-term memory lie outside our consciousness. To 'think', the brain transfers memories from long- to working-memory. Passage from working memory back to long-term memory is the bottleneck. Single-minded concentration (reading...), provides a trickle into long-term memory. The Net overloads working memory so only a small portion of information passes to long-term memory.

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AS A FAMILY
BY JUST
SPEAKING?



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Multitasking

- David Meyer: As we gain experience in rapidly shifting our attention, we may overcome ‘inefficiencies’, but you’ll “never be as good as if you just focused on one thing at a time.” What we do when we multitask “is learning to be skillful at a superficial level.”
- Michael Merzenich: As we multitask online, we are “training our brains to pay attention to the crap.” The consequences to our intellectual lives may prove “deadly”.
- The Net diminishes the ability to ‘know’, in depth, a subject for ourselves, to construct within our own minds the rich and idiosyncratic set of connections that give rise to a singular intelligence.

Know-less

- Clive Thompson: the Net is an 'outboard brain'. "I've almost given up making an effort to remember anything, because I can instantly retrieve the information online."
- David Brooks: Having thought the information age allowed us to know more, "then I realized the magic of the information age is that it allows us to know less."
- Don Tapscott: "with a click on Google" we can look up anything. Memorization is a "waste of time."
- Eric Kandel: Short-term memories take time to become long-term memories. The process of 'consolidation' is delicate and any disruption or distraction can sweep nascent memories from your mind.

The Brain

- Interneurons produce serotonin which fine-tunes the synaptic connection, modulating the amount of glutamate released into the synapse. Serotonin binds to a receptor on the membrane of the presynaptic neuron – the neuron carrying the electric pulse – which starts a chemical reaction that leads the neuron to produce a molecule called cyclic AMP, which in turn activates a protein called kinase A, a catalytic enzyme that spurs the cell to release more glutamate into the synapse, strengthening the synaptic connection, prolonging the electrical activity in linked neurons, enabling the brain to maintain short-term memory.

The molecular basis for 'consolidation'

- Kandel: “the growth and maintenance of new synaptic terminals makes (long-term) memories persist.” How it works:
- Additional ‘shots’ of serotonin (rehearsal) cause kinase A, along with another enzyme called MAP, to move from the neuron’s outer cytoplasm into its nucleus. There kinase A activates a protein called CREB-1, which in turn switches on a set of genes that synthesize proteins the neuron needs to grow new synaptic terminals. MAP also activates another protein, CREB-2, which switches off a set of genes that inhibit the growth of new terminals. Via a process of cellular ‘marking’ the resulting synaptic changes are concentrated at particular regions on the surface of the neuron and are perpetuated over long periods of time.

At least that’s the way a Sea Slug’s brain works...

Pancake People

- Walt Whitman: “I project the history of the future.” Each of us projects the history of the future. Culture is sustained in our synapses.
- Offloading memory to external data banks threatens the depth and distinctiveness of the self, and threatens the depth and distinctiveness of the culture we share.
- Richard Foreman: “I see within us all the replacement of complex inner density with a new kind of self – evolving under the pressure of information overload and the technology of the “instantly available”. As we are drained of our “inner repertory of dense cultural inheritance,” we risk turning into “pancake people – spread wide and thin...”

ART

- Attention Restoration Theory (ART) – when people aren't bombarded by external stimuli, their brains can 'relax'. The resulting state of contemplativeness strengthens their ability to control their mind.
- Berman, et al: Spending time in the natural world seems to be of "vital importance" to "effective cognitive functioning."
- Damasio: The more distracted we are, the less able we are to experience... empathy, compassion, and other emotions.
- Crovitz: "Technological progress does not reverse – the trend toward multitasking and consuming many different types of information will only continue." But we need not worry, because the "human software" will "catch up to the machine technology..." We'll "evolve".