

**BOOK REVIEW: THE SHALLOWS – WHAT THE INTERNET IS DOING TO OUR BRAINS  
BY NICHOLAS CARR, 2010, W.W. NORTON & CO., INC. NY  
REVIEW BY DENISE P. KALM**

Known for his controversial tome, "Does IT Matter", Carr returns to analyze the impact of surfing and Google on the way our brains function. He begins by tracing the history of technological innovation, explaining how even the creation of a readable language (which included spaces between words and punctuation) changed the way people thought. He offers neuro-physiological data and analysis from many studies which show the plasticity of human brains. In particular, he offers the studies of Gary Small. Small's work showed how people's brains were physically altered as they did Google searches. These studies showed that it didn't even take very many sessions of "surfing" before changes were noted.

But as parts of the brain adapt to hyperlinking and multi-media experiences, the function those brain cells were engaged in before is lost. People review more bits of disconnected data, but they do not integrate it, nor do they think or read as deeply. In fact, it becomes difficult for heavy internet users to actually focus on long articles and books.

Carr notes his own struggles with writing this book; he moved to Colorado and unplugged himself to solve the problem. He could not write coherently or consistently with the constant intrusion of IMs, emails and RSS feeds.

Part of the problem is the limited capacity of short term memory. Every long term memory must be transferred from the small buffer of working memory to the larger store. The Internet provides such a wealth of information that it overwhelms the capacity of the buffer. There is simply too much to retain. Technically, you have access to more information, but less actual value. Some studies indicate that increases in attention deficit disorder (ADD) relate to the overloading of working memory.

The saving grace is found in the cause of the problem – the brain's plasticity. After several weeks unplugged, Carr was again able to read deeply and write coherently. But this book is a useful cautionary about the loss of real reading material and upcoming webification of e-readers. Perhaps the iPad is the heroin of the Net.