Neuroscience: Browsing and the brain

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Abstract

Reference

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"I can announce to naturalists that this is the true Promised Land. Here nature created a special sanctuary where she seems to have withdrawn to experiment with designs different from those used anywhere else. At every step one finds more remarkable and marvellous forms of life."

Ridley describes how Baret discovered *Bougainvillea* in the forests of Rio de Janeiro using the doctrine of signatures, a medieval method by which herbalists attributed curative powers to plants on the basis of their appearance — a nut was good for brain trouble, red things for wounds. Commerson had an ulcerating sore on his leg, so Ridley writes of Baret searching frantically for a cure, only to find it in the red bracts of *Bougainvillea* holding a pea-like pod that reminded her of the red-flowered runner beans from home. However, *Bougainvillea* does not have fruits like a pea, nor do the notes on the specimen mention any medicinal value.

In his notes, Commerson honoured high-ranking members of the expedition — its leader is commemorated in *Bougainvillea*, Nassau-Siegen in *Nassauvia* — but he did not publish these names. *Bougainvillea* was formally described in 1789 by Antoine Laurent de Jussieu, a French botanist who used Commerson’s specimens and notes. Commerson also proposed the name *Baretia* for a Malagasy tree.

Ridley maintains that Commerson was an arrogant man who named things for himself. Yet the International Plant Names Index shows 119 species of flowering plants named in his honour — by others. None is noted as ‘commersonii’ on its original label. Commerson’s *Baretia* was never published, not because someone wanted to do Baret down, but because it was found, on the specimen’s return to Paris, that the genus already had a name.

After Commerson died, Baret married a French officer, Jean Duberna, on Mauritius and returned to France in 1774. She was awarded a state pension from 1785 in recognition of her bravery and contributions. She was not forgotten, although she never practised botany again.

Science was as collaborative then as it is now, but women’s contributions were often overlooked in favour of those of male colleagues — a trend that continues today. Baret and other neglected contributors deserve recognition, but she does not need to be cast as a victim to be seen as a success, or her undoubted accomplishments overinflated. She, and women scientists in general, deserve better. □

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The mind’s ability to adapt suggests that it can cope with our wired world — for better or worse.

**Browsing and the brain**

Two books reach opposite verdicts on how the Internet affects us, find Daphne Bavelier and C. Shawn Green.

Whenever a new technology reaches a tipping point of popularity, questions soon follow about its effects on society. The rise of the Internet has provoked two books probing its impact on the human brain. The fact that the authors reach opposite conclusions, despite relying on the same scientific evidence, underscores how little research has been done on this topic.

Nicholas Carr’s *The Shallows* laments the possibility that long-term Internet exposure will sap us of our capacity for contemplation. At the base of his argument is the fact that the human brain is remarkably plastic. Carr makes this point compellingly using a mixture of historical anecdotes and interviews with experts in the neuroplasticity field, such as Michael Merzenich and Eric Kandel.

Having established that brains are constantly reshaped by experience, Carr argues that changes induced by Internet use, such as greater brain activation during web browsing, may not be in our best interests. If the brain adapts completely to the frenetic nature of the Internet, he warns, we may lose our capacity for absorbing practices such as reading a book. He worries that we may lose the very essence of what makes us human.

Nick Bilton’s *I Live in the Future* is much more optimistic. Humming with enthusiasm for the continuing Internet revolution, he argues that social and cognitive changes are an inevitable consequence of any major technological advance and that our new abilities cannot be put back in the box.

Such tension is to be expected whenever new forces enter society. By analogy, Carr discusses historical fears that the written word would act as a replacement for memory, resulting in humans that were ‘shallower thinkers’. Bilton notes early worries that the freedom of travel offered by the railway would result in weakening moral standards. Both books review suspicions that most people would prefer to listen to a book than to read one, leading to concerns that the invention of the phonograph would kill the art of writing.

Is the Internet different? Bilton and Carr rely on the same scientific facts to argue persuasively for opposite positions. For example, functional magnetic resonance imaging studies show that Internet searches activate a larger network of brain areas than does simple text reading. Web browsing also requires additional types of mental processing — evaluating hyperlinks to make navigational decisions and filtering photos, videos and menus. As a result, brain activation is greater during Internet searches in people who are...
Abstract relativity

A Paris exhibition contrasts 1920s depictions of the fourth dimension, find Stefan Michalowski and Georgia Smith.

The birth of modern physics a century ago fired artistic as well as scientific imaginations. This can be seen in the Pompidou Centre’s current exhibition of abstract art, covering Dutch painter Piet Mondrian and the De Stijl group, led by another Dutchman, Theo van Doesburg.

A series of canvasses illustrates the evolution of abstract techniques, from the soft contours of impressionism to the spare geometry of cubism. “We arrive at a portrayal of other things, such as the laws governing matter,” Mondrian wrote. Cubist techniques were inspired, in part, by the multi-dimensional mathematics of Henri Poincaré and his contemporaries.

Most of the exhibition is rightly devoted to Mondrian and the development of his recognizable mature style. From a minimal toolbox of visual elements — white canvas, black lines and simple blocks of red, yellow or blue — emerge geometric compositions of startling intensity and elegance.

Mondrian was deeply influenced by theosophy, a spiritual movement grounded in ancient texts that was bent on uncovering universal truths in art, religion and science. He penned reams of theory as to why his abstract style was the appropriate expression of these “great generalities” for modern times.

A quiet introvert from a Calvinist family, Mondrian became a mentor to van Doesburg, by contrast a flamboyant young painter who had three wives and many artistic cliques in his short life (he died aged 47). When van Doesburg moved to Paris in 1923, the two men worked closely: their canvasses form a dialogue as each sparked fresh innovations from the other. But their intense relationship exploded a year later — and one of the flashpoints was the theory of relativity.

The public learned about Albert Einstein’s discoveries after the First World War, when the solar eclipse of 1919 confirmed general relativity by showing that gravity can bend light. In Paris, space-time became a catchword in avant-garde circles. Artists from futurists to Dadaists were inspired, in part, by the multi-dimensional mathematics of Henri Poincaré.

The De Stijl artists wanted to remake the human environment by designing furniture, buildings and cities based on their primary-coloured, idealized structures. Van Doesburg experimented with architectural designs and films incorporating the fourth dimension. Some of these products are displayed in the exhibition, but the role of the fourth dimension is not clearly shown or explained. The artists themselves do not always seem to have grasped the difference between a fourth dimension in space versus one in time.

As the artists tried to incorporate the newfound laws of physics in their expressions of absolute truth about the Universe, history ambushed them. Their comrades in abstraction were soon brutally dismissed by the Soviet and Nazi authorities. Einstein helped to pull the rug out from under their depictions of the “absolute” by dissolving special relativity’s neat geometries into quantum theory’s fuzzy clouds of probability. But Mondrian’s precise vision, with its subsumed scientific borrowings, continues to intrigue and delight.

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