Biological Psychology (PS6034): Book Review

Ramachandran, V.S. (1999). *Phantoms in the brain: Human nature and the architecture of the mind*.

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Report

The content in Phantoms in the Brain is mainly concerned with brain anatomy and how this affects human behaviour, namely behaviour that is difficult to explain and has controversy surrounding it. For example, one of the reasons the author is so interested in phantom limbs and phantom limb pains is because it has long been passed off as mere curiosity with only weak theories attempting to explain or 'cure' it. In the outlined exploration, the author draws not just from neurology, but also from psychology and at times other areas also (such as philosophy).

Phantoms in the Brain has several clear themes, the most obvious being neurology and how the brain functions, especially in regards to how it relates to phantom limbs. However, perhaps another of the stronger ones is that of new ideas. In several chapters, the author clearly states that if you have a new or unique idea, you shouldn't let go of it; even if it is difficult to test or challenges what is seen as scientific dogma. An example of this being where a doctor challenged that ulcers were caused by bacteria, not stress (Ramachandran, 1999, preface, XV). Similarly, the author also says that science does not always have to be theory driven, though many are reluctant to admit this – "God forbid that you should just try to do something entirely new that's just based on a hunch!" (Ramachandran, page 94). As it is these areas in the book where the author achieves the most compelling and thorough evidence, these themes will be focused on.

The reaction that people experience when faced with the idea of phantom limbs can be both wonder and bewilderment. How can somebody feel and have sensations from something that is clearly not there? This is why very little experimentation was carried out before the 1990s on people who had phantom limbs as the phenomenon was usually passed off as a mere curiosity. And even before 1990, research on the topic was mainly just classifying cases of phantom limbs, such as its

prevalence one day, eight days and six months after amputation surgery (Jensen, Krebs, Nielsen & Rasmussen, 1983). It wasn't until Pons et al. (1991, cited in Kalat, 2007) conducted their research on sensory remapping in monkeys and Ramachandran read it that he wondered if it applied to humans and phantom limbs also (Ramachandran, 1999, page 27-28).

Ramachandran writes that when an amputation occurs, the cells in the sensory cortex for the amputated area can be taken over by adjacent cells that belong to other areas of the body. Using this theory, he mapped (using a q-tip of all things!) where a patient could feel his phantom hand on his face! This is due to the hand and arm being next to the face on the sensory cortex, so the face took over the inactive cells. Once this had been realised, it explains why phantoms in all areas occur. An unusual one for example, is where one amputee experienced orgasms in his phantom foot (the feet and genitals are next to each other on the sensory map)!

This finding lends itself to the idea that the brain is not necessarily hardwired as many might believe – it can adapt to damage it has sustained. This concept is further supported by Price (2005) who points out that if we were completely hardwired, you would expect to see more cases of phantom limbs in child amputees. Something the author cannot explain though is why some amputees have intense phantom pains. This is important to research because although the pains fade in some cases, the ones where the pain continues can be very disabling (Ehde et al., 2000) and can also cause depression, severe in some cases (Whyte & Niven, 2001).

Hill (1999) points out that although we now know why phantom limbs occur, thanks to the work put forward in Phantoms in the Brain and other similar research, the focus must now be on phantom pain. She reports that despite research in this area, there are many shortcomings, which unfortunately results in limited application. This is not strictly true however; as Ramachandran displayed a simple and effective method to free movements in paralysed phantoms limbs and in some cases reduce pain (Ramachandran, 1999, pages 46-50). He does admit that phantom pain is very difficult to explain, though he offers some possibilities, such as sensory remapping gone wrong or chronic pain memory. What can truly be said though is that in this book however, is that Ramachandran achieves his objectives in discovering and explaining how and why phantom limbs occur, as well as suggestion solutions to the patients who suffer from them.

The second theme that will be focused on from Phantoms in the Brains isn't one that is focused on in any one or more chapters (such as phantom limbs and pain or zombies) but rather one that is more recurring in that it appears throughout the book – that of new ideas and challenging dogmas. The author makes it well known from the beginning of the novel that he will be looking at cases that have been dismissed by other in the field as mere curiosities (Ramachandran, 1999, page 2). He also points out (and gives examples) of how you do not need complicated equipment to make revolutionary or even ordinary discoveries, which is a very comforting to know. Unfortunately, it does seem that feasible new ideas are easy to come up with, indeed many people struggle in this area (Sharts-Hopko, 2000). Despite this, Ramachandran makes a point of stating more than once that if you have a novel idea that you think will work, do not dismiss it if possible.

The author's view on this area is shared by other researchers. Wolf (1999) points out that it is dogma (in whatever field) that prevents the advance of scientific knowledge. This is despite the facts that even though time and time again throughout history, so many dogmas have eventually been shown to be incorrect (the Earth being flat, for one). This is then further supported by Prigatano (2003) who states that challenging dogma isn't just to advance or test your own ideas, but is essential for fields such as neuroscience and neuropsychology. He does in fact make a very similar argument as Ramachandran against the dogma that brains are hardwired, and understanding the changes after brain damage can significantly improve skills in diagnosis, treatment and recovery (Prignato, 2003). Phantoms in the Brain provides evidence for this, as it is clear from Ramachandran's work that areas of the brain can change after sustaining injury, otherwise phantom limbs would not occur through sensory remapping.

In conclusion, Ramachandran is clearly successful in achieving certain objectives he laid out, such as explaining phantom limbs and outlining the important of new ideas and challenging dogma. There are some parts of Phantoms in the Brain where the arguments he makes are much weaker, because it is a topic where you can only speculate, rather than gain scientific results (for example, Chapter 9: God and the Limbic System). Despite this, he did say at the beginning of the book that he was not setting out to solve everything he writes about, but rather to 'convey the spirit that makes neurology fascinating' (Ramachandran, 1999, page 3).

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