Ramachandran on Consciousness: Neuroscience as Philosophy

INTRODUCTION

A noted neuropsychologist, V.S. Ramachandran has shown considerable interest in the philosophical ramifications of neuroscientific discoveries. In the tradition of Luria, Ramachandran believes that a careful study of brain abnormalities may lead us to a better comprehension of global processes. In addition to his scientific papers, his popular works—*Phantoms in the Brain* (co-written with Sandra Blakeslee) and *A Brief Tour of Human Consciousness*—present numerous speculations about the nature of consciousness. While he does not specifically address the issue of consciousness in any one extended passage, his written works do present the careful reader with a fairly unified notion of consciousness.

The idea of "unconscious zombies" within the brain emerges as a recurring motif of *Phantoms in the Brain*. Ramachandran's emphasis of the unconscious aspects of cognition might lead some to think him an epiphenomenalist. A doctrine that regards consciousness as virtually a 'side-effect' of behavior, epiphenomenalism does not attract many adherents. Believers in this notion hold that behavior is carried out by unconscious processes; volition is merely an illusion. While Ramachandran decries the idea that human consciousness may simply be an epiphenomenon (1998; 235), he does acknowledge that many (and perhaps most) neural processes have only the most tangential relationship to consciousness. Ramachandran believes that consciousness is causal, but that a great many parts of human behavior lie just outside of consciousness. In the picture that Ramachandran paints, human beings emerge as a strange creature; part

zombie, part willful agent. Were Ramachandran merely a philosopher, many people would prefer to ignore his uncanny ideas about human consciousness. But because Ramachandran builds his philosophical ideas on the latest neuroscience, one must consider these notions carefully.

QUALIA

Nagel

Ramachandran does an admirable job challenging the "qualia problem" of Nagel (1972). A recurrent challenge to the study of consciousness, Nagel's notion of qualia emphasizes the qualitative difference between experience and mechanism by discussing the essence (qualia) of sense perception. Suppose an articulate person tells us that he is looking at a red fire engine. He may try to describe the hue of the color, the impression he has of it, and otherwise convey his 'experience' of this color. At that same time, a neuroscientist who has deviously implanted all manner of electrodes in this poor fellow's brain can describe to us the varied electrical impulses, neurotransmitters, and physiological circuits that all coalesce to produce his experience of red. But no matter how detailed the scientist's description of the mechanism by which this person sees red it remains separated, as if by a chasm, from the his actual experience of seeing red.

When Nagel first brought up this 'problem,' a number of formerly optimistic philosophers and scientists lost hope: what was the point of going to all the efforts of describing mechanism and causation if we couldn't even approach an understanding of experience? It seemed, given this philosophical argument, that the first person experience was forever separated from the third person account of that experience. In the

ensuing years since this qualia problem emerged (and after many hundreds of papers and books have been written about it) people are not nearly as concerned about this so-called problem as they once were. Ramachandran sums up his own take on the issue:

> For centuries philosophers have assumed that this gap between brain and mind poses a deep epistemological problem—a barrier that simply cannot be crossed. But is this really true? I agree that the barrier hasn't yet been crossed, but does it follow that it can never be crossed? I'd like to argue that there is in fact no such barrier, no great vertical divide in nature between mind and matter, substance and spirit. Indeed, I believe that this barrier is only apparent and that it arises as a result of language.
> (1998; 231)

A firm believer in empiricism, Ramachandran would prefer to learn more about consciousness from observation and experimentation before he gives up the endeavor due to some logical barrier. In the absence of information, philosophy attempts to use reason to get at things. But with an innovative approach towards experimentation, science may provide significant new clues to understanding age-old problems. One must applaud neuroscientists like Ramachandran who inquire into problems so intractable that they hardly seem worth investigating. But, as two bicycle mechanics taught us, sometimes tinkering with the impossible (heavier than air flight), leads to surprising results.

Qualia and its little men

One of the most astonishing aspects of qualia comes from the 'filling-in' effect. The most notable filling in occurs in vision and derives from the blind spot in the eye. The fovea is the place where the optic nerve meets the retina. This sizable spot on the retina does not feature any rods or cones; in other words, it has none of the machinery

which the eye needs to perceive the world. In spite of this virtual hole in vision, no one has a direct appreciation of the missing visual information from this foveal zone. And yet, simple visual experiments indicate how this information truly is missing from vision. The brain fills in the gap in one's visual field, leading the experiencer to believe no such gap exists. The striking thing is that the brain engages in all sorts of such deceits in both our perceptual systems and, according to Gazzaniga's left hemisphere interpreter theory, in our representations of larger scale processes in consciousness (1992).

The phenomenon of filling-in leads some to postulate a central aspect of consciousness that directs such conscious unity. Neuroscientists like Ramachandran evade this 'homunculus' notion in favor of a more naturalistic account: "I would like to suggest that the 'something' that qualia are filled in for is not a 'thing' but simply another brain process, namely, executive processes associated with the limbic system including parts of the anterior cingulated gyrus" (1998; 252). Filling-in represents an aspect of consciousness that smoothes over gaps, inconsistencies, and ultimately aims for a statistical averaging of input signals. Filling-in represents, on the perceptual level, what defense mechanisms and a perceived unity of self represent on the cognitive level. This picture of cognition hypothesizes numerous systems and subsystems that participate in an orchestrated fashion to generate a unified sense of conscious existence. Rather than a 'little man' pulling levers and sorting information, we have a systemic principle of filling-in and dynamic coordination that builds a statistically accurate and individually adaptive representation of self and environment. From an incomplete, gap-prone, and mistake-ridden sense of qualia, our brains manage to construct seamless conscious worlds with enough fidelity to keep us interactive in a highly dynamic environment.

REPRESENTATIONS

The idea that one of the brain's main tasks is that of representing the environment—and representing the organism's body in that environment—emerges in numerous places in Ramachandran's writings. In his latest work, *A Brief Tour of Human Consciousness* (2004), Ramachandran articulates his current model of consciousness, an interesting model that leans heavily on the language and memory centers of the brain.

Ramachandran reviews his ideas about qualia in the early part of the book and notes that sensory impressions ultimately provide us with sophisticated representations of the world. We can manipulate these representations to address present and future needs. Using language, we can codify representations so that our ideas can be conveyed to others and even recorded through song and writing. By increasing the sophistication with which we could work with representations, and by integrating memory with these representations, proto-humans achieved a state of mental manipulation of signs (or tokens of meaning) that no other animal approached. Finally, humans evolved—both biologically and culturally—to a point where we could even stand outside of our representations and engage in representations of representations or, as Ramachandran tentatively calls them, "metarepresentations" (2004; 99). It is with the manipulation of metarepresentations, according to Ramachandran, that we engage in human consciousness as we know it.

The play of metarepresentations is a fundamentally new type of computational approach that allows radical modeling of the environment, including the presence of and interaction with 'other minds.' Metarepresentations rely on language, sophisticated

memory systems, and shared (cultural) meaning-making. Ideologies, philosophies, and all intellectual models derive from an appreciation of metarepresentations. Even simple strategies rely on this concept. For instance, a group of early hominids using metarepresentations and language (which recursively relies on them and helps to shape them) might discuss a simple hunt and what to do if the prey does X, what to do if it does Y, or what to do if it does Z. None of these possibilities is actual; they probably represent observed cases of past instances (cases retrieved from memory), designated with a token sign (a word or set of words), and projected as likely possibilities given the situation of the hunt. But even this simple strategizing represents a quantum leap over that of less sentient animals. Indeed, much of what we call 'consciousness' is just such a collection of strategies, encoded memories, and emotional or attitudinal stances. The self, one's identity, and the working philosophies by which an individual understands reality all emerge from this capacity of metarepresentation.

A possible critique of this notion of metarepresentations is that it could lead to an endless regress. Ramachandran counters this objection by noting that our minds can really only step back two or three iterations before falling into total confusion (2004;151). An attitude of cyncism, irony, and humor often relies on representations of metarepresentations but beyond this stance lies no meaningful platform on which to stand. Perhaps a critical stance vis-à-vis metapresentations (an ironic or cynical stance) represents a type of hyperconsciousness already quite removed from reality.

Anosognosia

Ramachandran has spent a great deal of time and energy trying to understand the

puzzling phenomenon of anosognosia. Associated with damage to the right parietal lobe (usually from stroke), anosognosia results in the vehement denial of physical handicaps. A stroke victim may lose significant portions of the right cortex and resultantly lose function on the left side of his body. Surprisingly, many such stroke victims will deny that they have lost such functionality. They often make up the most fanciful stories to explain their lack of movement on that side. As Ramachandran describes:

> Watching these patients is like observing human nature through a magnifying lens; I'm reminded of all aspects of human folly and of how prone to self-deception we all are. For here…is a comically exaggerated version of all those psychological defense mechanisms that Sigmund and Anna Feud talked about at the beginning of the twentieth century—mechanisms used by you, me and everyone else when we are confronted with disturbing facts about ourselves. (1998; 130)

Anosognosia is the neurological equivalent—writ large—of all those small scale denials and confabulations that go on in everyone's mind all the time. These are the 'little lies' that keep us unified in our sense of self and convinced of an ongoing identity through time. But even a brief reflection on who we were as children compared to who we are now indicates a radical change in identity.

Ramachandran elaborates on Gazzaniga's left-hemisphere interpreter theory (1992) as a means to explain the irrational denial of handicaps that anosognosiacs engage in. But why would damage to the right parietal lobe lead to this excessive confabulation in the left hemisphere? Ramachandran believes that this portion of the right hemisphere serves as an important corrective to the left-hemisphere interpreter; it is the "Devil's Advocate" to the sometimes zany denials of the left-hemisphere (1998; 136). When anomalous information builds to a threshold point, "…the right hemisphere decides that it

is time to force a complete revision of the entire model and start from scratch. The right hemisphere thus forces a 'Kuhnian paradigm shift' in response to anomalies, whereas the left hemisphere always tries to cling tenaciously to the way things were" (1998; 136). When people suffer damage to these critical right hemisphere structures then the left hemisphere is left free to exercise its denials and oversights without check (Ramachandran and Hirstein 1997). Gazzaniga's extensive studies of hemisphere lateralization support this striking ability of each hemisphere to interpret the world in its own distinctive fashion and deal with anomalous information in its own way (1992). The mind, then, is virtually split. Consciousness arises from the interaction of both hemispheres and ongoing diplomacy between two camps which are usually in conflict. The difference between the absurd delusions of anosognosiacs and the defense mechanisms of everyone else is one of degree, not kind.

ALTERED STATES OF CONSCIOUSNESS

As is true of his discussions of consciousness in general, Ramachandran does not engage in prolonged discussions about altered states of consciousness. In specific studies of certain abnormalities—like temporal lobe epilepsy—underlying ideas about ASCs may be discerned.

Temporal lobe epilepsy

In a chapter of *Phantoms in the Brain* entitled "God and the Limbic System," Ramachandran discusses a number of intriguing cases of temporal lobe epileptics. Temporal lobe epilepsy (TLE) is akin to normal epilepsy, in which storms of electrical

activity get out of control. The distinction of TLE is simply that its epileptic foci mainly affect the temporal lobes. The temporal lobes are highly significant for emotional processing. Additionally, the neural circuits necessary for religious experience seem to lie in these areas. This finding helps to explain why temporal lobe epileptics tend to be unusually preoccupied with religious ideas.

Since, according to Hebb (1949), "what fires together, wires together," we must wonder about the recurrence of TLE and its influence on the personalities of its sufferers. Ramachandran reviews literature about the "temporal lobe personality," a strange combination of traits that reliably cluster in temporal lobe epileptics. Ramachandran notes that: "Patients have heightened emotions and see cosmic significance in trivial events. It is claimed that they tend to be humorless, full of self-importance, and to maintain elaborate diaries that record quotidian events in elaborate detail..." (1998; 180). Noteworthy temporal lobe epileptics include Fyodor Dostoyevsky and Edgar Allen Poe, two authors who extensive writings and profound ruminations continue to astonish their even-keeled readers. Some researchers entertain the notion that religious leaders like Muhammad and Saul of Tarsus may have suffered from TLE (LaPlante 1992).

Temporal lobe epileptics often experience religious ecstasy during or shortly after their seizures. Such experiences certainly qualify as altered states of consciousness. Furthermore, TLE may often lead to such profound insights that the temporal lobe epileptic considers himself to be a victim of the "sacred disease," the title that the Greeks used to designate epileptics. No doubt the Greeks had made the correlation of TLE and religious experience long before we had a good understanding of brain diseases. The overlap between intensely meaningful altered states of consciousness and TLE suggests

ASCs to be a side-effect of a malfunctioning brain. Though Ramachandran does not come out with such a strong hypothesis, he does support Gould's ideas about evolution: namely, that many distinctive traits may be due not to selection but to by-products of selection (1998; 210). ASCs, according to this model, may not have developed from specific selection pressures but may represent, if not outright malfunctions of a normally functioning nervous system, then at least a type of functioning that did not evolve as an end in itself.

CONCLUSIONS

Learning about the brain through its disorders, as V.S. Ramachandran does, presents a number of problems. Does the working brain differ in as yet undefined ways from the broken brain? Is the study of broken brains to understand working ones equivalent to studying parts instead of processes? While the reductionism that Ramachandran utilizes (the study of neural elements to understand conscious processes) to think about consciousness should not be taken as the ultimate method to unravel the mysteries of the mind, it remains the best tool we currently possess. Through studying the anomalous disorders of anosognosia, temporal lobe epilepsy, and the brain's perceptual representations, Ramachandran is able to construct sophisticated models of consciousness.

By showing the unusual degree to which anosognosiacs deny anomalous facts, Ramachandran helps to support a psychodynamic model of consciousness; a notion of consciousness as an ongoing balance between a number of different styles of information processing. In his study of temporal lobe epileptics, Ramachandran helps to elucidate

religious experience. Such experiences have their basis in defined brain circuits, circuits which, when overactive (as in epilepsy), may lead to profoundly significant altered states of consciousness. While these meaningful experiences should not be discounted as damaged brains spinning off into meltdown, they should be understood as vectors of evolution that evolved from interstitial emergent properties. In other words, they are side-effects of our basic neural machinery. Just as listening to entertaining stories may contribute nothing towards our survival value, so religious experience and ASCs may imbue our behaviors with meanings that they do not require for successful selection. Human consciousness derives from a set of perceptual representations that have increased to such complexity that we have become capable of representing our representations. By clever manipulations of these metarepresentations we control and predict our environment as well as construct stable notions of identity and meaning.

Ramachandran's ideas about consciousness, while grounded in thorough materialism and reductionism, lead us to appreciate our basis as a representational species, as meaning making animals. Ramachandran's use of empirical methods to address the perennial questions helps to validate neuroscience as "the new philosophy".

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