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Are You Gonna Believe What You See, or What People Tell You?

If you ask a young boy where he sees a chair, he will point across the room and say, "It's over there, next to the window." If you ask a neurologist the same question he will say, "All my visual experiences are in my brain. They are probably in my neocortex, the likely location of consciousness. That specter across the room is an illusion."

Which one do you believe? Which one is the illusion?

Let me make my choice clear. I believe the young boy. I see no reason to believe that visual consciousness is ever located in the brain or in any other part of the body.

Other kinds of awareness are found in diverse parts of the body. Often, consciousness appears close to the stimulus that gives rise to it. If someone steps on my toe, I say, "Ouch, my toe." I do not say, "Ouch, my brain," or "Ouch, my spine," or "Ouch" about any other part of my body. In this case, the pain that I experience is close to the stimulus. However, a complete description of the assault goes through my foot, up my leg to my spine and back, and makes a separate trip to my brain. It is a whole-body pursuit, even though the resulting pain is only in my toe. So the total production of consciousness (i.e., the whole-body involvement) and the manifestation of consciousness (i.e., the painful feeling) are not necessarily located in the same place, and in fact, they are never entirely located at the same place.

If someone has a memory of a sad occasion, he may feel the sorrowful pain in his stomach and chest and around his eyes. If the memory is one that makes him angry, he may also experience that in his stomach and chest, but maybe this time in

his lower jaw too. In both cases the range of physiological involvement (i.e., the scope of the production) extends to parts of the spine and brain that are not involved in actual conscious experience. So again, the production and manifestation of consciousness do not share the same location.

Vision is different. Following the external stimuli (e.g., electromagnetic radiation) coming from the chair, the production of visual consciousness is entirely contained *inside* the body, but the resulting visual experience is located entirely *outside* the body – over there next to the window. Evidently the post-stimulation production of consciousness and its manifestation have *completely separate* locations: one inside of the body and the other outside.

How Is This Possible?

How can the production site of consciousness be different from the manifestation site, much less the dramatic difference we see in vision?

Consciousness is not a commodity in the ordinary sense. It does not obey Newton's laws or anybody else's laws that we know about. Consciousness is a complete stranger to physics, so physics cannot prescribe how it will behave. We cannot put a theoretical limit on what consciousness can or cannot do. So without theoretical guidance, the least we can do is be good empiricists. The least we can do is be accurate about what we observe. Maybe one day we will have a convincing theory of consciousness that will reveal how it is related to the rest of the universe. But until then we have to believe what we see (like the empiricists we are supposed to be) even if that doesn't conform to the Cartesian sensibilities that are so much a part of scientific tradition. I believe these sensibilities are the illusion that the young boy hasn't yet learned.

Descartes

René Descartes did not believe in action-at-a-distance. Instead he maintained that an influence moves from point to point along a continuous line, having an effect in some form at all points along the way. Newton's gravitational theory challenges

Descartes by directly addressing actions-at-a-distance, but Einstein's gravitation reverts to the Descartes' notion of contiguous influence. The pendulum swings back again when quantum mechanics introduces non-local correlations that describe a non-contiguous effect that violates the velocity of light. This is one of the things about quantum mechanics (in addition to probability) that most disturbed Einstein. Clearly, the tradition on this subject is long and varied. While most scientists today accept quantum mechanics, the Newtonian idea of action-at-a-distance remains largely counterintuitive. Most scientists reject the idea that consciousness can exist outside of the body inasmuch as its origins are so traceable to activities inside of the body. They share the Cartesian sentiment that the boy's conscious awareness of the chair is in his brain. To them, the young boy's testimony is just an illusion.

"Of course," you say, "it's an illusion. How can consciousness exist in the vicinity of the chair?" I don't know the answer, but I ask you, "How can it exist in your brain? How can it exist anywhere? How can it *not* exist anywhere?" No one knows the answer because consciousness, as you recall, is a stranger to physics. In the absence of a believable basic theory, the only reasonable thing we can do is swallow our tradition-bound sentiments and trust observation. Until we have good reason to think otherwise, consciousness *is* where consciousness appears to be.

Descartes believed that visual consciousness exists inside the brain at a place that is referred to as the *Cartesian theater*. This is where information from different parts of the brain are supposedly collected and screened for viewing by consciousness. It is the place where the unconscious process of the brain are said to become conscious. But does such a place exist inside the brain?

After reviewing the evidence to locate this neurological viewing room, O'Regan and Noë not only found it insufficient, but they asked a further question: "What would happen if we were to actually find a set of neurons that correlated *perfectly* with visual awareness?" They concluded, "We would still lack an explanation of how the image (in this tiny projection room) *generates* seeing" [O'Regan 2001 sect. 8.2]. And there's the rub. *There is no currently sound scientific reason to suppose that consciousness would attach itself to a collection of neurons (a cause of consciousness), than it would to the chair across the room (a more distant*

cause of consciousness). The empirical evidence points to the chair across the room, and that's the best we can do at the present time¹.

Temporal Binding

Dennett points out that the creation of Descartes' neurological screening room would be repetitious and unnecessary. Referring to all the operations of thought and action that occur throughout the brain, the *re-creation* of these relationships for the benefit of the audience in the Cartesian theater would be a wasteful reproduction, according to Dennett [1992]. For one thing, there is no audience there.

What are these diverse thoughts and actions? If I look at a horizontal stick that is red on one end and blue on the other, then there is a neuronal site in the extended visual cortex that registers "red", and another site that registers "blue", and still another that registers "horizontal stick". Somehow these locations have to be brought together for the combined image to appear in consciousness. How does that happen? The Cartesian theater is of course one answer. Accordingly, these three neuronal sites would transmit their results "red, blue, and horizontal" to the central screening room, where they would be joined for final viewing. But how would this "joining" take place if there is no Cartesian theater?

Probably no neurologist believes in the Cartesian theater anymore, preferring some form of *temporal binding*. Crick and Koch proposed that the scattered properties of a given object (e.g., its redness, blueness, and horizontalness) are related to each other by their respective neurons firing coherent semi-synchronous oscillations that identify them as pertaining to the *same object* [Crick 1990]. That is, the different neuronal sites know each other by a shared resonance. This relationship, spread out as it is across the brain, is sufficient to unify a single object in consciousness. It isn't necessary to reproduce that relationship anywhere else in

¹ You may ask, "How far from the eye can a person project visual consciousness?" The answer depends on the ability of the production centers in the brain to coordinate distance. It may be that visual manifestations cannot go beyond the limit of three dimensional resolution, and that things beyond that range will appear to fall on a flat surface like a painted landscape.

the brain for the benefit of an audience that isn't there, for according to these authors, a person's unified consciousness of an object is based entirely on this neurological resonance.

Experiments with the visual systems of cats and monkeys have generally verified temporal binding, where the synchronous signal is not a simple resonance but is structured more like a barcode. According to Engle et al., this *binding code* makes it "possible to establish a distinct representational pattern (a so-called assembly) for each object, and thus would enable the visual system to achieve figure-ground separation"[Engel 1999]. Compared to a simple resonance, these authors point out that a barcode has the advantage of "robustness against loss" as well as a "richness of representations."

Extended Production

If someone steps on my toe, the resulting pain is centered in my toe, although its production requires my brain. The synchronous circuits that identify and motor-control the toe are located in the brain, as are nociceptive pathways from the toe to cortical areas of the brain. So although consciousness appears at the site of the original stimulus, the brain must be included in the production process because of its broad neuro-associative resources.

The same is true when looking at the chair. If we extend the production system to include the chair, then consciousness appears at the site of the original stimulus (i.e., at the chair, analogous to the toe). But again, the brain must be included in the production to produce consciousness. Neither the toe by itself nor the chair by itself has this capability. Consciousness manifests itself at these diverse sites for reasons that are survival related, not production related.

Conclusion

Visual consciousness is not causal like other more primitive aspects of consciousness, such as pleasure and pain [Mould 2009a, 2009b, 2010]. It is purely

informative. But however one represents the production of vision, the manifestation of visual consciousness is patently outside of the body.

To describe visual conscious phenomenon, I use two categories: production and external manifestation. A manifest-in-the-brain model requires three categories: production, a neocortical manifestation, and an *illusory* external manifestation. The second exists in the brain, and the third is a clever trick of the second. I submit with Dennett that this is unnecessary reproduction. To describe vision, only production and external manifestation are *necessary and sufficient*.

It is not possible to “explain” vision or any other form of consciousness at this time. There is much more to be done at the fundamental level because consciousness (in contemporary physics) has no place in the universe – inside or outside of the body. Consciousness is not supposed to exist, even as an illusion. Amid the fields and particles of theoretical physics, there is no such thing as seeing, hearing, feeling, and so on. And yet, these things are in the universe as surely as you and I are in the universe. We are conscious, and so the universe (through ourselves) is conscious. Our feelings and sensations have an ontological status that is comparable to the atoms and molecules of our bodies, although physics does not yet recognize that.

The challenge is to relate consciousness to the material things of contemporary physics. This will require establishing a meaningful relationship between the apples and oranges of mind and matter. There is a lawful entanglement between these two things, and I assume it will be unraveled some day by a logic I cannot foresee. In addition, a non-local correlation of some kind will be necessary to achieve a non-contiguous leap from inside production sites to outside manifestations such as vision, or to inside manifestations such as a pain in the toe. Of course I don’t know how any of this will come together in the end, but I assume it will be worked out. Physics will eventually deal with consciousness and integrate it into the rest of the universe. We will then be able to do justice to this phenomenon that is our window to reality, and the basis of our physics.