

# Consciousness, Mind and Free Will

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# Introduction

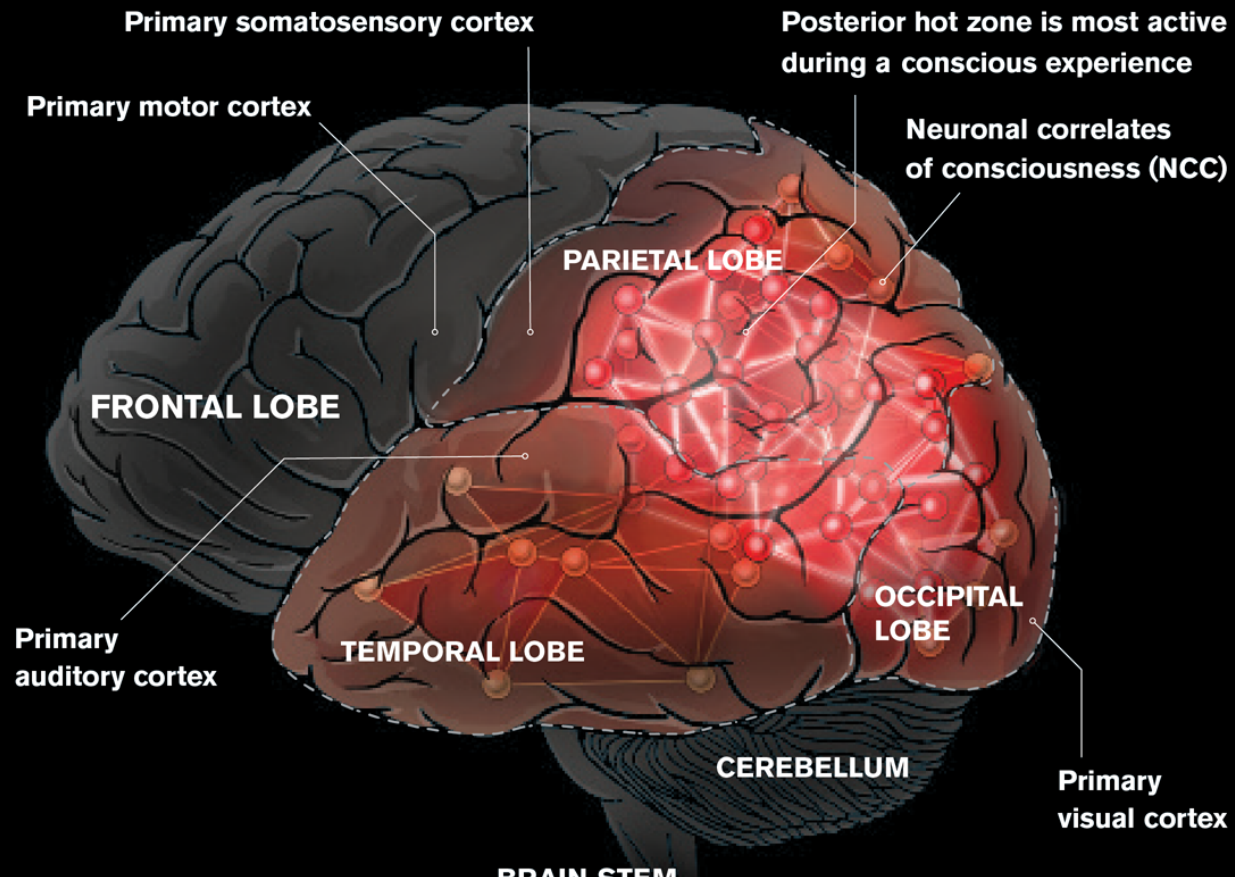
- The fact that humans are conscious and seem to perform many complex acts, have emotions, generate aesthetics (art, music, etc.) has been a problem to explain.
- Many have thought mere material can't do all these things and something extra is needed
- Humans seem to need a non-material aspect to their being. Some call it a spiritual soul
- This however presents its own problems.
- Enter Science to give insight into what the brain can do.

# A Consideration

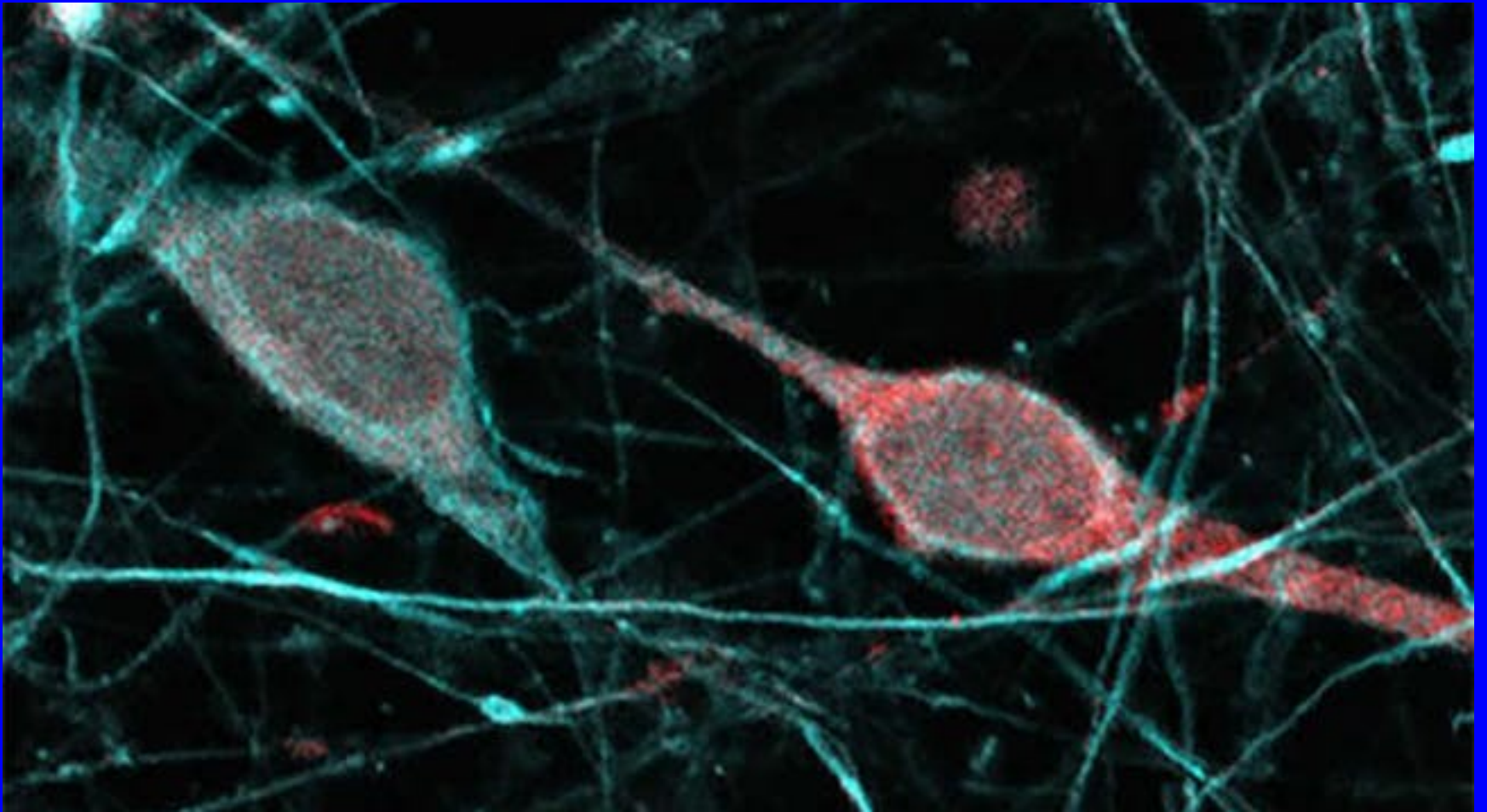
- Humans always seek meaning in things.
- Science however keeps showing there is no meaning—
  - Evolution vs. Adam and Eve
  - Music of the Planets vs Planetary resonances
- Apparently this is the same for Consciousness
- Scientific way of looking at it is mechanical not how the philosopher suggests.
- We need to change our view of the entire phenomena in order to understand what's really happening.

# *Footprint of Experience*

Conscious awareness is closely associated with the cerebral cortex, an intricately folded and connected sheet of nervous tissue. Each experience corresponds to a specific set of neural activities, called the neuronal correlates of consciousness (NCC), in a posterior hot zone of the brain that consists of the parietal, occipital and temporal lobes of the cerebral cortex. Complexity of the neural excitations after a magnetic pulse yields a measure of the degree to which a person is conscious.

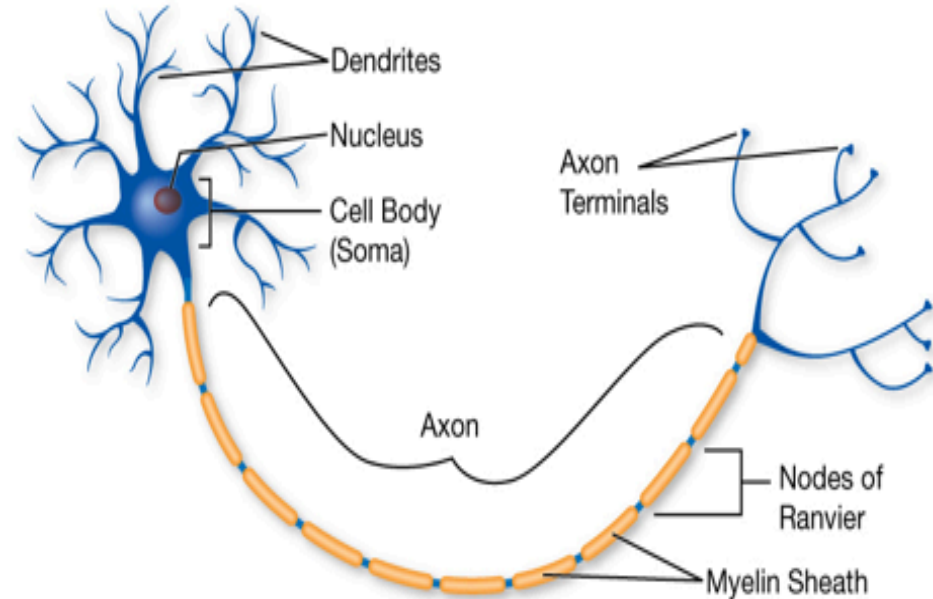
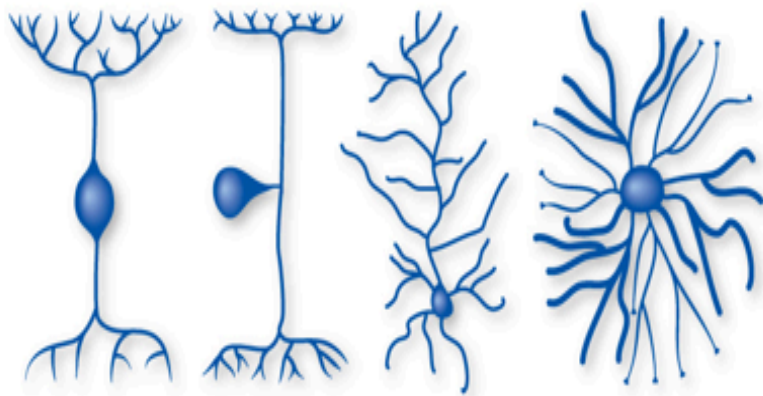


# Neurons



# Neurons Transmit Messages In The Brain

Neurons are the cells that pass chemical and electrical signals along the pathways in the brain. They come in many shapes and sizes. Their shapes and connections help them carry out specialized functions, such as storing memories or controlling muscles.



# Humans versus Higher Animals

- Despite all of the battles that we would lose to a fellow member of the animal kingdom, there are a whole host of cognitive abilities which are uniquely human, that no other animal could contend with. All of the following behaviours, as well as many other imaginative concepts, have currently been demonstrated exclusively in humans:
  - Advanced planning and decision-making
  - Humour
  - Appreciation of mortality
  - Adaptation to unsuitable environments (e.g. deserts and frozen lands)
  - Morality
  - Religion and worship
  - Vulnerability to neuropsychiatric disease
  - Enhanced connections between neurons
  - Non-personal comprehension

# When Brains Don't Work

- It's clear that **damaging the brain** in specific ways **destroys consciousness** and all other functions such as sight, emotions, etc.
- For Dualists this begs the question of how a spiritual soul can be made ineffective by a material change in the brain.



# Enter Science

- Stanislas Dehaene's and others' careful and ingenious studies of unconsciousness and consciousness.
- Several new observational tools—magnetics, electric currents—allow study of sometimes individual neurons.
- Clearly there are places where memories are stored.
- We can stimulate areas and get actual conscious images.

# Unconsciousness

- Below our conscious awareness are a myriad of unconscious operations going on all the time.
- These have been studied in some detail.
- They are our preprocessors which sort out extraneous material, modify sensory input to make it intelligible (example sight—what the input is and what the unconscious does with it).
- Preliminary decision making
- Automatic reactions

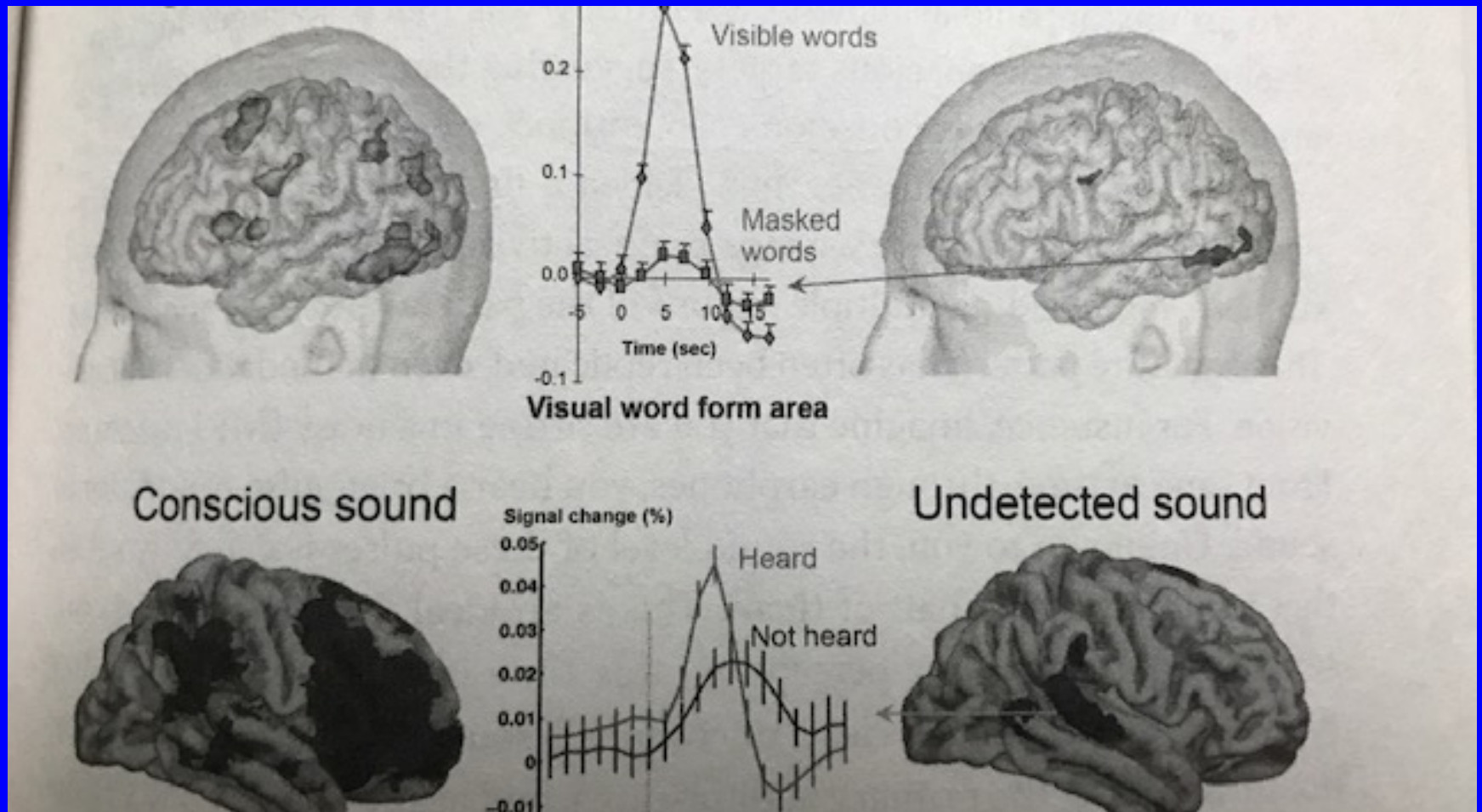
# When not Conscious

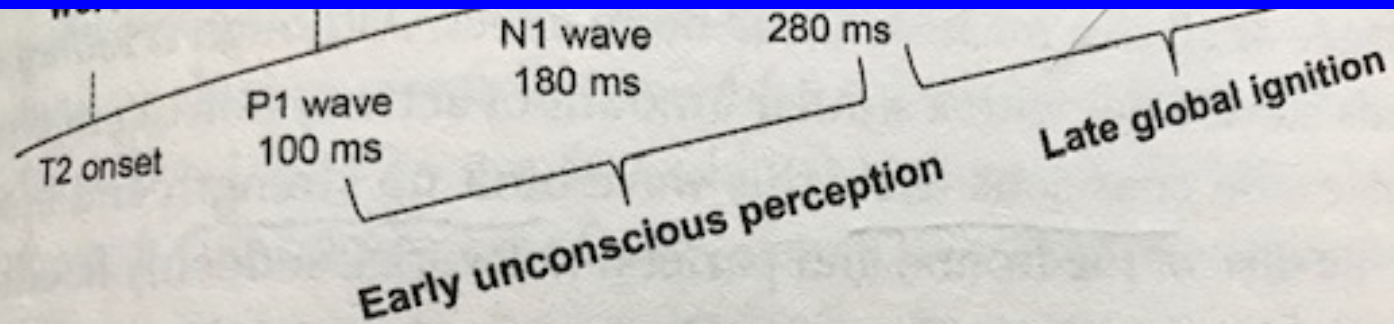
- The true test of how good a theory of consciousness is whether it can **also explain a loss of consciousness**.
- Normally when awake and alert, fast activity can be found all over the brain and **signals can be passed between areas**. When we go into a deep sleep however, the brain moves to a state where **signals cannot easily pass** between different areas.
- The evidence that suggests **interconnectivity is crucial** for higher brain power.
- BUT describing the externally visible phenomena of consciousness is far from a complete project – the research described has **merely scratched the surface**.

# Observing the Brain

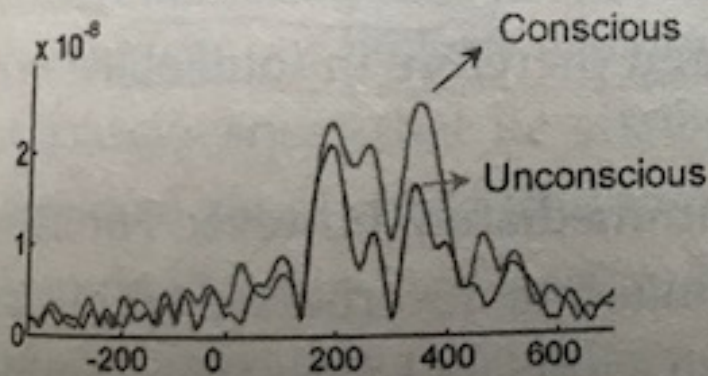
- Many very clever studies in visual perception allow us to separate consciousness from unconsciousness.
- Lots of details ruling out this or that interpretation.
- Consciousness seems to be establishment of a “global neuronal workspace” where signals can be interactive and productive.

# Measuring Differences in Signals





Activity in visual cortex



Activity in prefrontal cortex

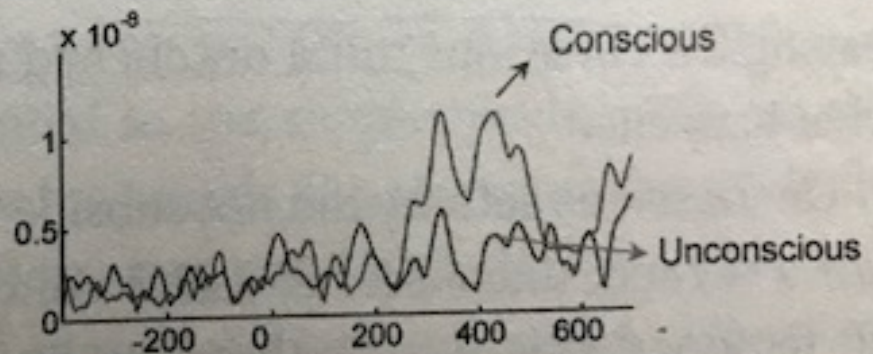


FIGURE 18. Slow positive waves over the top and back of the head provide a... of conscious perception. In this experiment, words were

# Summary—

## What Unconsciousness Does

- Many Automatic functions—breathing, but much more
- Quick responses many of which are “learned”
  - Compliment a tennis player syndrome
- Orders and directs ideas---”sleeping on it”
- Orders language syntax
- Biases conscious decisions—happy or sad words
- Produces phenomena like out of body experience
- Makes pre-judgments and pre-decisions
  - Unconscious proposes and Conscious selects

# Observed differences between U and C

- During **unconsciousness** neurons are active but at a low level and signals are not sent to higher processing points in the brain and die out.
- But during **consciousness** signals are passed on to higher parts of the brain and an amazing amount of signaling takes place back and forth.
- Signals are sent back “down” as well as all across the brain, and their sum remains stable for some time.
- Thus **we can look at neuron signal activity and tell if a person is conscious.**
- Allows decisions about people in vegetative coma!



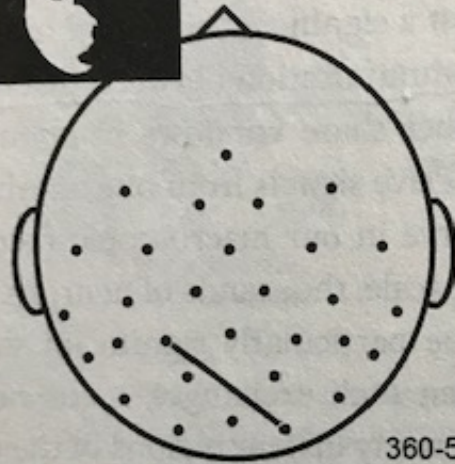
# Without Science there are Real Problems

- But while philosophical approaches can be useful, they do not constitute testable theories of consciousness, scientists say.
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- Understanding how the material brain produces subjective experiences, such as the color green or the sound of ocean waves, is what Australian philosopher David Chalmers calls the "hard problem" of consciousness.
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- Bernard Baars, a neuroscientist at the Neurosciences Institute in La Jolla, California, developed the theory, which is known as the **global workspace theory**. This idea is based on an old concept from artificial intelligence called the blackboard, a memory bank that different computer programs could access.
- Anything from the appearance of a person's face to a memory of childhood can be loaded into the brain's blackboard, where it can be sent to other brain areas that will process it. According to Baars' theory, **the act of broadcasting information around the brain from this memory bank is what represents consciousness.**
- **Consciousness is just brain-wide information sharing.**

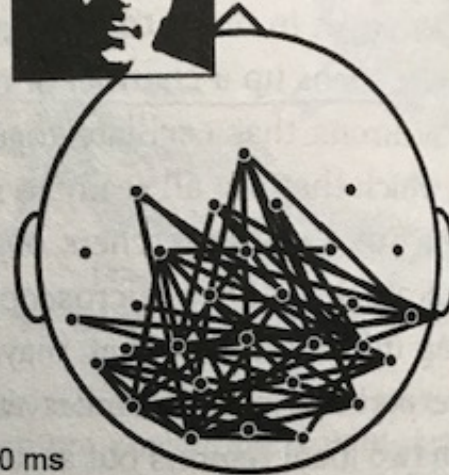
# Mechanics of Thought

- During conscious access thanks to the workspace neurons' long axions, all these neurons exchange reciprocal messages, in a massively parallel attempt to achieve a coherent and synchronous interpretation.
- The global workspace model claims that, at any given moment, out of the enormous potential unconscious set, **a single object of thought gets selected** and becomes the focus of our consciousness.

**Invisible face**

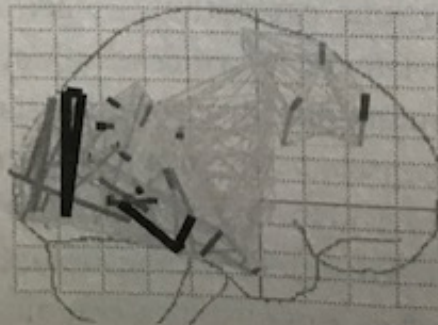


**Visible face**



360-540 ms

**Invisible word**



**Visible word**

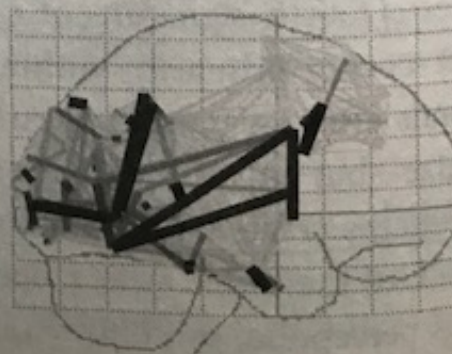


FIGURE 21. The synchrony of

# Causal of Not

- So we know what the brain is doing in great detail, but **are these neuron firings causal?** Do they actually cause consciousness or just result from it?
- We can stimulate the brain to “perceive” certain things such as light flashes, feeling that one has moved a limb, or is sad, and many other perceptions merely by sending an electric signal to the appropriate place in the brain.
- Thus we now know the **observed brain activity actually causes consciousness!**

# Causing Impressions

- Stimulating parts of the parietal lobe can even cause **out of body experiences** where the subject thinks it is near the ceiling looking down at one's own body!
- I once had just that experience during an ear ache operation as a child!

# Scary Future

- “By stimulating the appropriate neurons and silencing others we should be able to re-create at any given time hallucinations of any of the myriad subjective state that people routinely entertain. Neural avalanches should cause mental symphonies.”
- Similarly it might be possible to investigate memories such that **secrets can't be hidden!**
  - Not all bad because it would get rid of torture.

# Reductionist Conclusion

- “All our conscious experiences from the sound of an orchestra to the smell of burnt toast result from a similar source: the activity of massive cerebral circuits that have reproducible neuronal signatures.”
- “This leaves no doubt that the electrical activity of neurons can cause a state of mind, or equally destroy an existing one.!”
  - Dehaene, p. 158

# How Does This Happen?

- “Only mathematical theory can explain how the mental reduces to the neural.”



# Enter a Computer Program

- Very simple but reproduces much of what has been observed!
- “Computer simulations of neural networks show that **the global neuronal workspace hypothesis generates precisely the signature that we see in experimental brain recordings.** It also simulates why vast amounts of knowledge remain inaccessible to our consciousness.”

# Free Will

- Considerable study. Apparently most of human activity is not a result of a free decision
- Anticipatory energy in brain PRIOR to decision!
- BUT Quantum/chaotic nature of life seems to **preclude strict determinism**
- Bottom Line—some decisions seem to be freely made. But does this **require** a Soul?

# Free Will?

- Our decisions are free when they are based on **conscious deliberation** that proceeds autonomously, without any impediment, carefully weighting the pros and cons before committing to a course of action.
- Our Brain both conscious and unconscious makes decisions all the time, sorts among possibilities and picks the most appropriate ones. **Thus decision making is a normal function of the brain.**
- This is true even if it is ultimately caused by our genes, our past history, and the value functions we have instilled in our neuronal circuits.
- Thus even if our brain architecture were fully deterministic, as a computer simulation might be, it would still be legitimate to say that it exercises a form of free will.

# Bottom Lines

- Many of the complex functions we give names to such as “mind” are simply words to signify complex interactions of the neurons.
- It seems possible to write a computer program that can simulate how the brain produces consciousness and unconsciousness.
- So we can be machines, but machines with Free Will. **What we do with our machine is up to us!**

# Pierre de Chardin

- Interesting speculation
- Spirituality is already in creation
- Quantum particles can be arranged in such a way as to incorporate a soul-like nature
- Avoids special creation and melds material and spirit leading to bodily resurrection

# Inspiration of the Holy Spirit in Scientific Terms

- Since inspiration is really **acquisition of information**, perhaps the Holy Spirit can enter our minds through the unconscious.

# The Soul: What is it?

- A spiritual soul seems to solve the problem of how we are intelligent.
- But what is it, where does it originate, and when do we get it?
- Evolution would seem to show we are not all that different from the most intelligent animals. So do they have souls?

# Posited Functions of a Soul

- Life
  - Probably no longer tenable
- Higher mental functions
  - Consciousness-Self Awareness
  - Free Will
  - Aesthetics
  - Universal search for meaning
- Existence after death
  - Religious reasoning from faith in afterlife before final resurrection of body



# What Does Scripture Say?

- “Paul points unquestionably to the uniqueness of humanity in comparison to all other creatures. This tradition **does not** locate this singularity in the human possession of a “soul”, however, but in the **human vocation**, given and enabled by God, to relate to God as **God’s partner in covenant**, and to join in **companionship within the human family** and in relation to the whole cosmos in ways that reflect the covenant love of God.
- ‘Humanness’ in this sense, is realized in and modeled by Jesus Christ.”

# Biblical accounts of afterlife that seem to support dualism

- Lazarus and Rich Man Parable
- Moses and Elijah at the Transfiguration
- “David rejoiced to see my time”
- “I am the God of the living not the dead”
- Psalm 16: 11 “you will not abandon my soul to the netherworld, ”

# Problems with Soul

- **When do humans get a soul?**
  - If at conception, billions of souls wasted
  - If afterwards, when?
  - What about identical twins?
  - When does a fertilized egg become a “Person”?
  - What does the soul do for you when you are alive?
  - Get it when you need it?—i.e. when you die?
  - Why is it that apparent functions of Soul cease when parts of the human brain are damaged?
  - How does a spiritual entity interact with a material entity?

# Perhaps a Solution

- What if the soul is actually God's loving knowledge of us?
- The science seems to have placed out of bounds several other areas such as consciousness, etc.
- Life after death but before the final resurrection could thus be controlled by God as needed.

# Conclusion

- Despite a large amount of evidence to the contrary, this issue must be considered open.
- We seem to have something extra
- Scripture, while ambiguous, seems to say there is more to us than material
- I propose we consider the soul as God's loving and deep knowledge of us.

# References

- Dehaene, Stanislas, *Consciousness and the Brain*, Penguin Books, 2014.
- Kock, Christof, *Consciousness: Confessions of a Romantic Reductionist*, MIT Press, 2017.
- Miller, Kenneth R., *The Human Instinct: How we evolved to Have Reason, Consciousness, and Free Will*, Simon & Schuster, 2018.
- Murphy, Nancy, *BodiesandSouls, or Spirited Bodies?* ,Cambridge Univ. Press, 2006.

# Questions for Discussion

- Give examples of Conscious and Unconscious activity you've experienced.
- Give examples of experiences you have had that don't seem to come from a material brain
- How hard is it for you to switch from a "philosophical" to a "scientific" treatment of Consciousness and Free Will?
- How might society change when we've mastered control of brain activity?