

# Metaphysics and consciousness

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# Why *neurophilosophy*?

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## Nature of the mind

- Classically part of philosophy
- Thought about without insight from neuroscience.
- Topics traditionally included:  
memory and learning  
consciousness  
free will

- Integrating the knowledge from neuroscience to answer questions posed by philosophers.
- Neuroscience techniques are at a point that they can address some of these questions.

## Intersection of Philosophy and Neuroscience

# Terminology-Metaphysics

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origin

- The book after *Physica* by Aristotle

physica

- Nature
- Questions on the nature of things.
- “Why do things fall?”

metaphysica

- Relevant for all sciences
- First philosophy
- *A priori*
- Pure



Rock Bottom  
Foundation for  
all of science.

# Metaphysics - Methodology

- *Pure*  
Metaphysics:

- Metaphysical answers are beyond the reach of scientific methods - Churchland

function

- Purpose: to be the absolute foundation for all of science.

methods

- Pure reason, reflection, introspection, & meditation

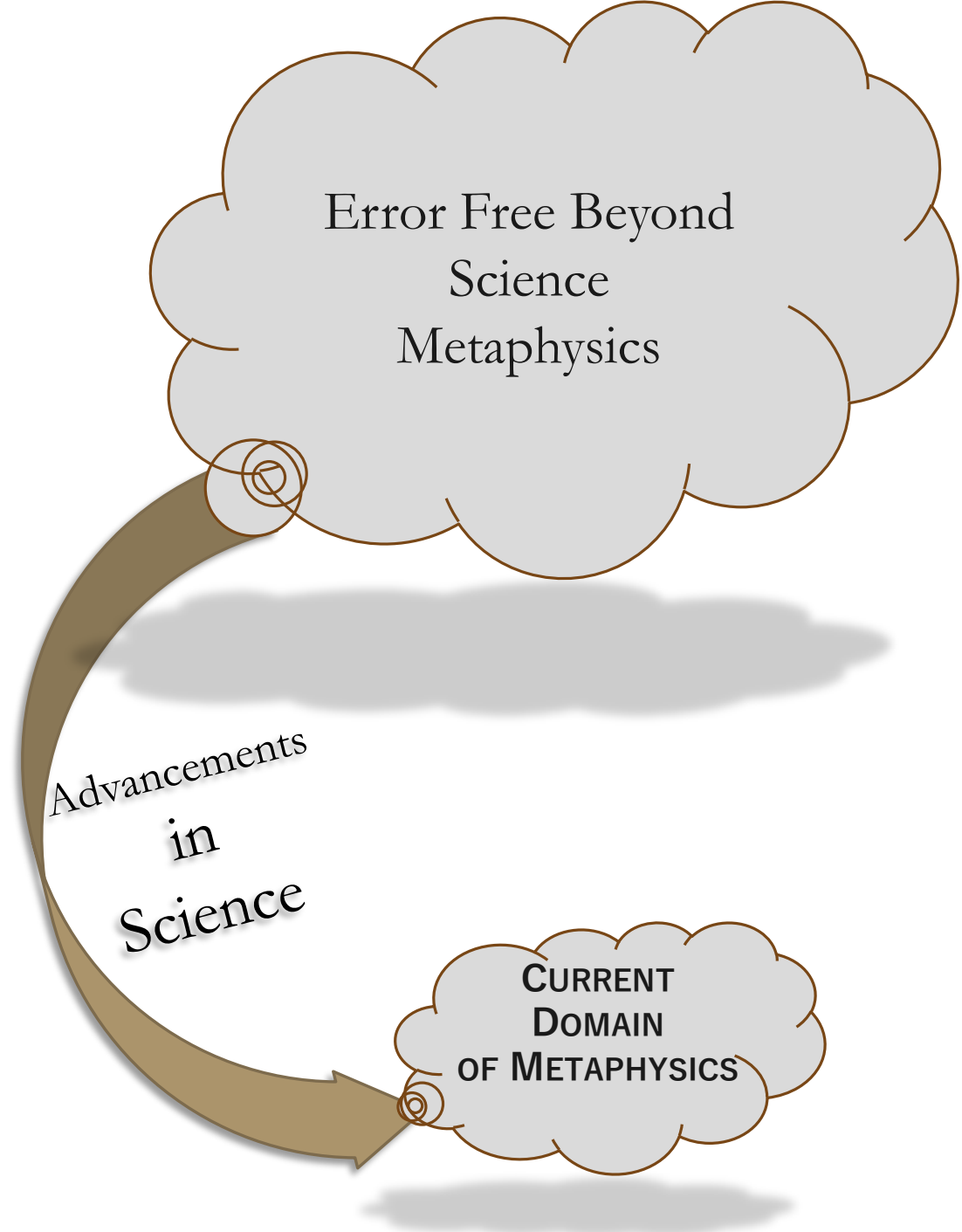
status

- Science itself depends on how metaphysics turns out.

Error Free Beyond  
Science  
Metaphysics

Advancements  
in  
Science

**CURRENT  
DOMAIN  
OF METAPHYSICS**





# The Pragmatists

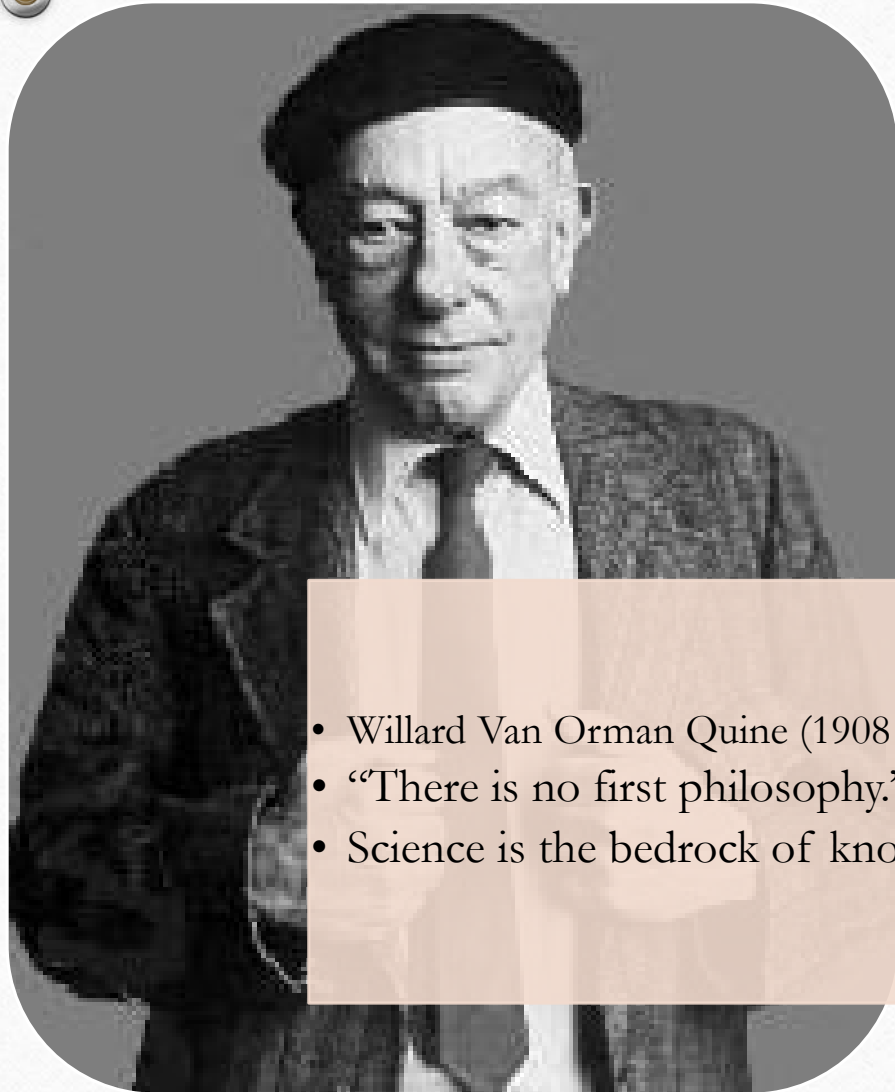
Use reason and introspection to guide initial impetus to study something.



- Charles Sanders Peirce (1839 – 1914)
- No such thing as “rock-bottom” foundation for all of science.
- Scientific method is all that is needed.

• Scientific method

- Observation
- Experimentation
- Hypothesis formation
- Critical analysis



- Willard Van Orman Quine (1908 – 2000)
- “There is no first philosophy.”
- Science is the bedrock of knowledge.



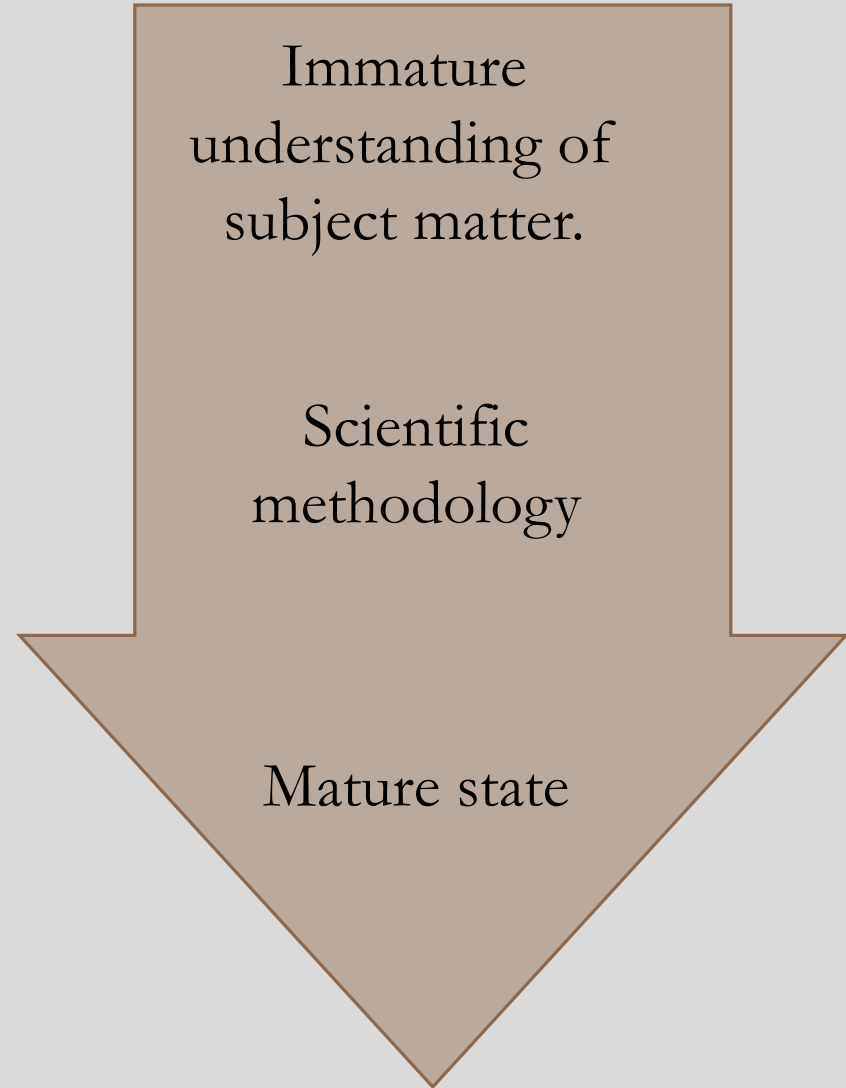
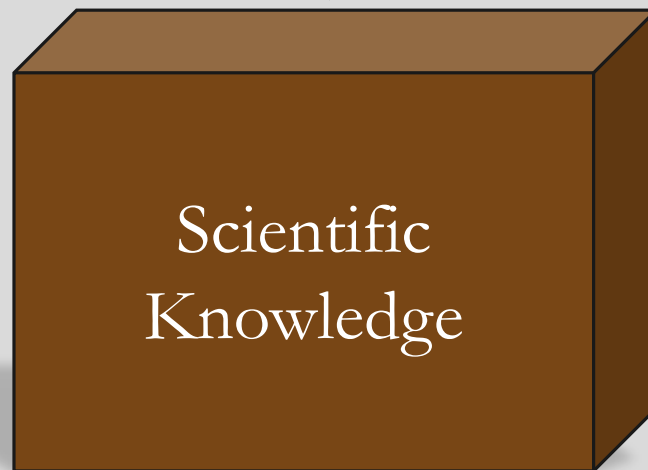
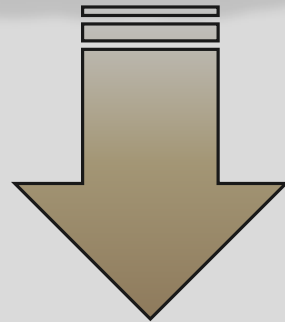
Scientific  
method

- “Nothing is more fundamental than science itself.”

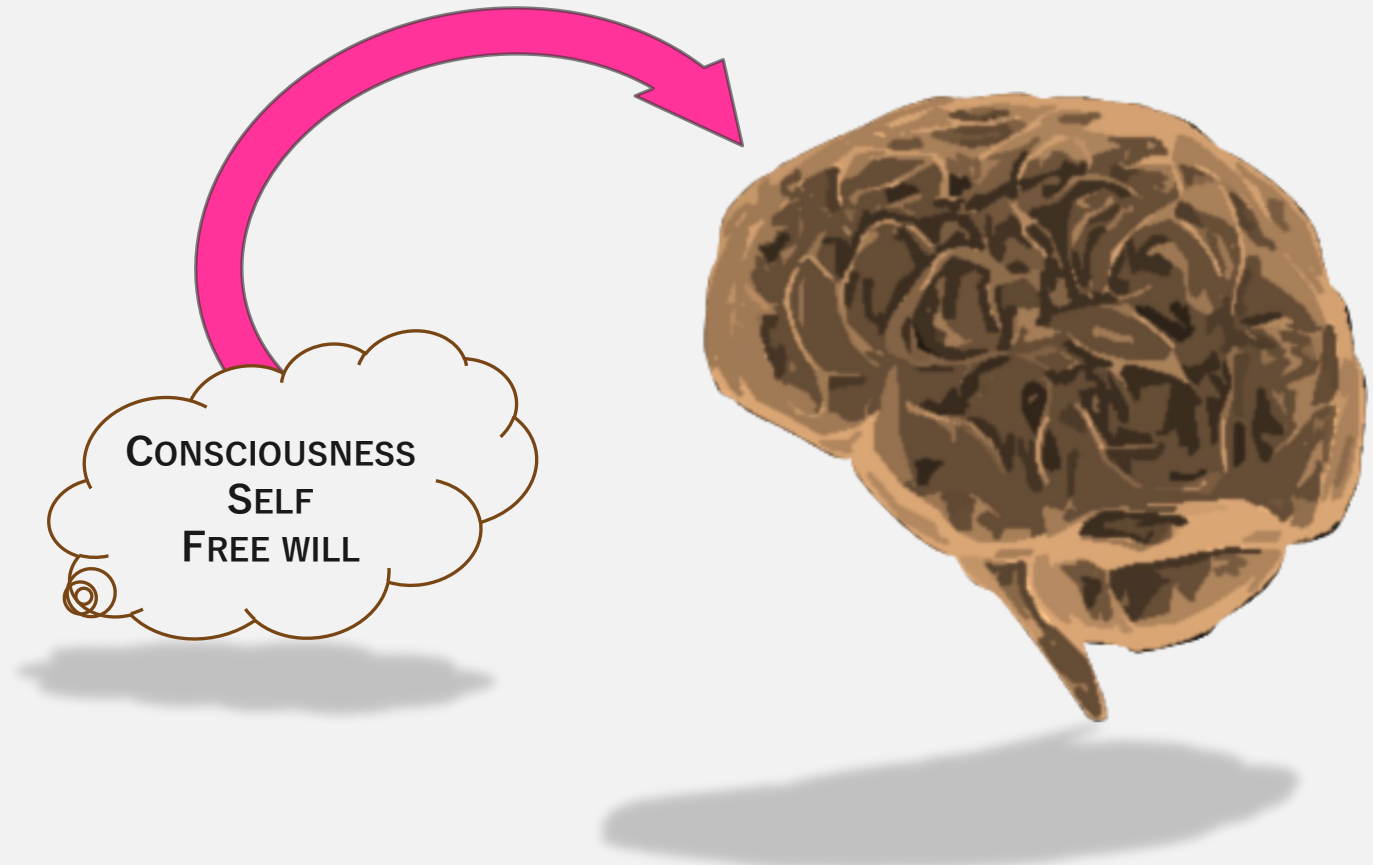
- There is no independent method for discovering the nature of reality than using science.




Today:  
Re-characterize Metaphysics



# Is there a Mind : Brain problem ?





Is the *mind*  
something  
separable  
from the **brain**,  
or something  
that is  
dependent  
upon it



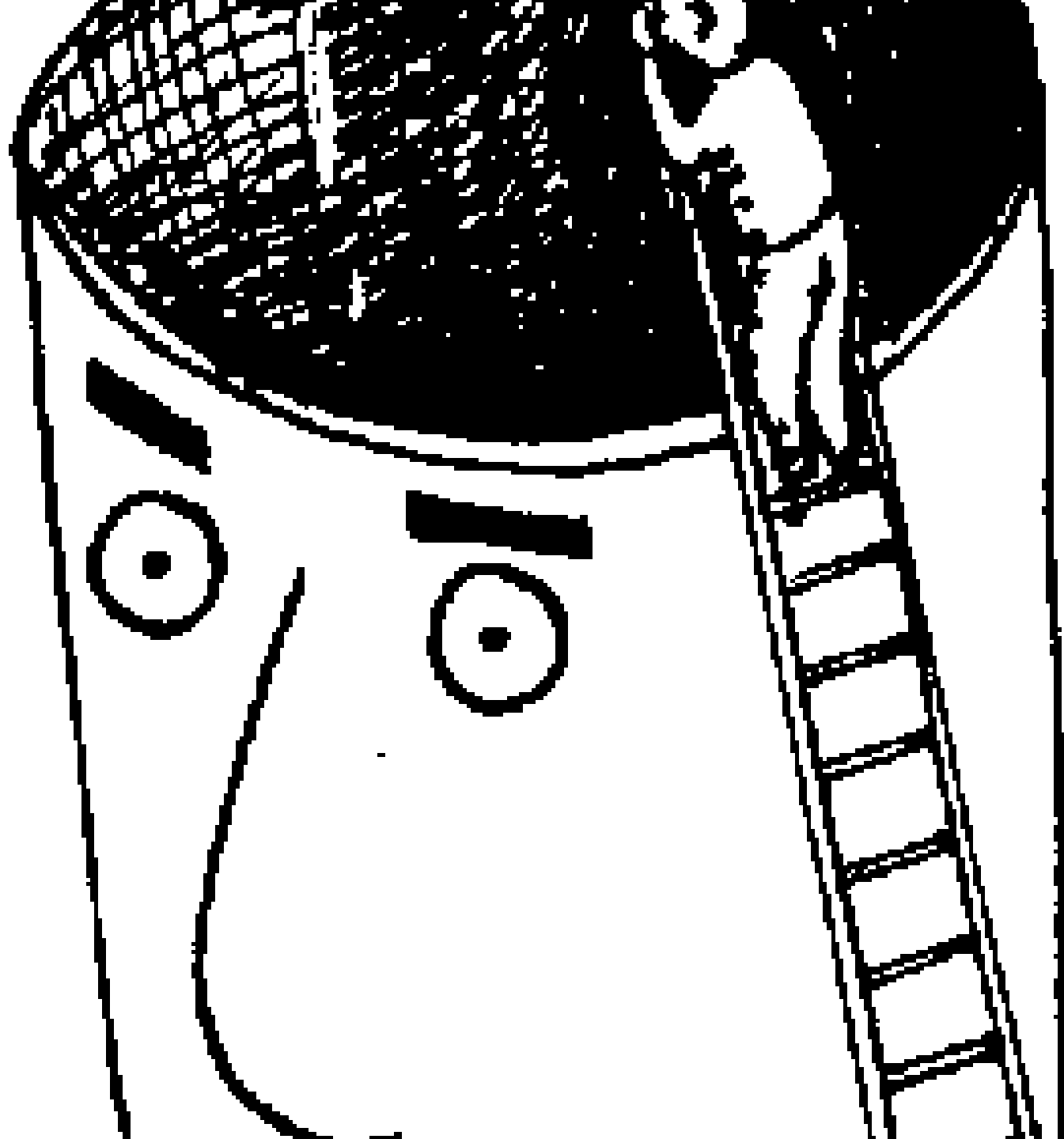
WHAT IS THE NATURE OF THE MIND?





**How did I separate my mind from my body?**

– Neo, The Matrix: Revolutions



{ size, shape, location  
**material** }

**mind** ↔ **body** relation  
interaction?



{ immaterial  
states of mind:  
thought, emotion,  
location in space? }



# Materialism

**Look past the flesh. Look through the soft gelatin of these dull cow eyes.**

– Smith/Bane, *The Matrix: Revolutions*



**Can specific mental states be reduced to specific states of the brain?**



materialism



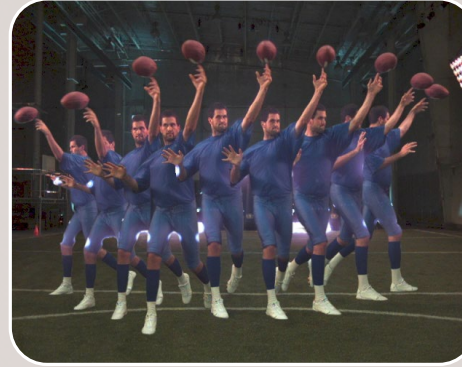
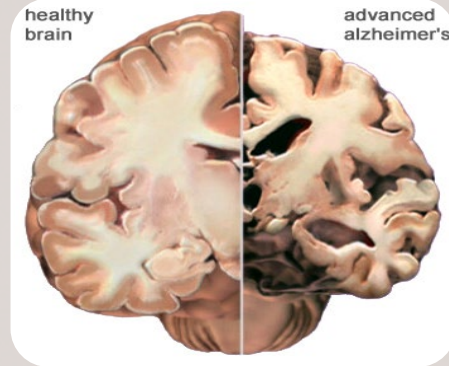
**How do the machines really know what Taste Wheat tasted like?**

– Mouse, The Matrix



*Dependencies*  
between  
**Brain**

**structures**  
and the  
**Mind:**



Memory Loss  
Alzheimer's  
Disease

Loss of  
Function  
Blind Sight  
Motion  
Blindness

Shift in  
Consciousness  
Sleep-Wake



# Understanding subjective states

Purpose

How the  
distinct states  
come about?

Qualia

“In most brain states are not directly associated with conscious sensations:  
We have almost no access to the structures that give rise to speech, to depth perception or color vision, to the rapid sequence of sensory-motor transformations necessary to play soccer, climb a rock wall, or return a tennis ball, let alone those influencing perspiration, heart rate, or the action of our immune systems; unlike qualia, these proceed in blankness.

**Where is the difference between the two?”**

# Brain to consciousness

Greatest unsolved question in science

Self consciousness

- The ability to examine one's own desires and thoughts

Content of consciousness

- What are you actually conscious of at this moment?

Brain relationship?

- Which processes relate to consciousness and non-consciousness?

We still don't understand enough – but...

First step

NCC  
Neural Correlates of  
Consciousness

Brain activity that  
matches with specific  
conscious experiences

NCC are the **minimal set of neuronal mechanisms** or events jointly **sufficient** for a **specific conscious percept** or experience.



# ○ The concept...

simple

- Special set of neurons
- Activity → Consciousness

physical

- Consciousness would have a physical location

but

- where to start?
- Hint: start small!

Which neurons are needed to have **any** form of consciousness at all?

# questions

What are the smallest set of neurons responsible for a particular percept?



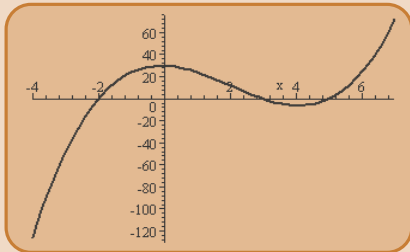
## Enabling factors?

Minimal conditions needed for **any** consciousness



## Specific factors?

Minimal conditions needed for a **particular** conscious percept



## Continuous or discontinuous?

- Modulating the degree of consciousness?
- Is it as simple as on or off?

# Enabling factors:

(what must be in place for consciousness to occur)

Proper  
blood  
supply

Functional  
brainstem  
MRF  
(mesencephalic reticular  
formation)

Acetylcholine

Non-specific thalamic  
activity



**The reticular activating system is involved in overall arousal.**

