

# Mind *or* Brain? Science *and* Spirit.

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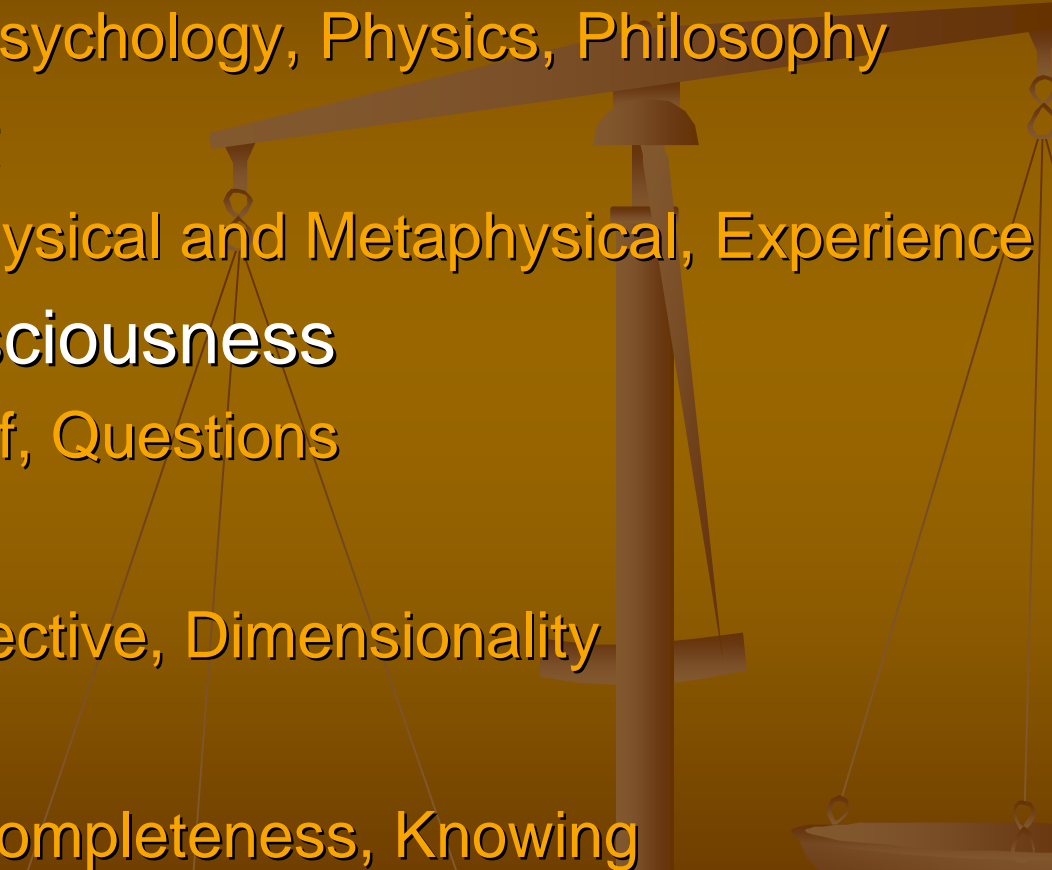
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# Outline

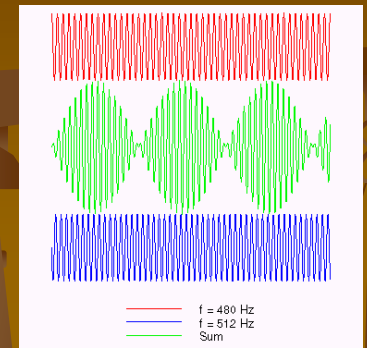
- The Realm of Science
    - Neurophysiology, Psychology, Physics, Philosophy
  - The Realm of Spirit
    - Belief and Faith, Physical and Metaphysical, Experience
  - The Realm of Consciousness
    - Levels, Models, Self, Questions
  - The Realm of Time
    - Subjective and Objective, Dimensionality
  - Conclusion
    - Uncertainty and Incompleteness, Knowing
- 

# The Realm of Science



# Basic Physics

- Wave Mechanics – Energy Based
  - Frequency, Superposition & Interference
  - Velocity (Group & Phase)
- Relativity
  - Speed of light is constant, Time is relative
  - Mass and Energy are equivalent
- Quantum Mechanics – Information Based
  - Measurement & Probability
  - Entanglement



$$E = mc^2$$

$$|\psi\rangle = \sum_{i=1}^N c_i |i\rangle \xrightarrow{\text{measure}} |j\rangle \langle j|\psi\rangle = c_j$$

# Basic Philosophy of Mind

## ■ Definitions

### ■ Qualia States

- Simple, Subjective, Intrinsic and Private (Heat, Color)

### ■ Supervenience

- Properties of the one group determine the properties of another

### ■ Type and Token (“A very, very, very long day.”)

- ‘Type’ refers to characteristics (kind); ‘Token’ refers to properties (#)

## ■ Schools of Thought

### ■ Monism – there is only one kind

- Type: Consciousness (Ideas) Supervenes; Token: Brain Supervenes

### ■ Dualism - there are Body things and Mind things

- Type: Two Objects; Token: Two Classes

### ■ Materialism – there are material things

- Type: Mental = Physical; Token: Mental = Functional

### ■ Functionalism – there are functional things

- Type: Psychological = Functional; Token: Intentional = Functional



# Basic Psychology

## ■ Processes

### ■ Sensation and Perception

- Attentional states are correlated with stimuli

### ■ Learning and Memory

- Intentional states correlated with action states

### ■ Motivations and Emotions

- An underlying temporal framework is evident

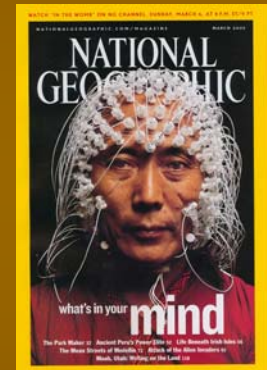
## ■ Mechanisms

### ■ Projection

- Assuming that others act or perceive similarly

### ■ Neurosis

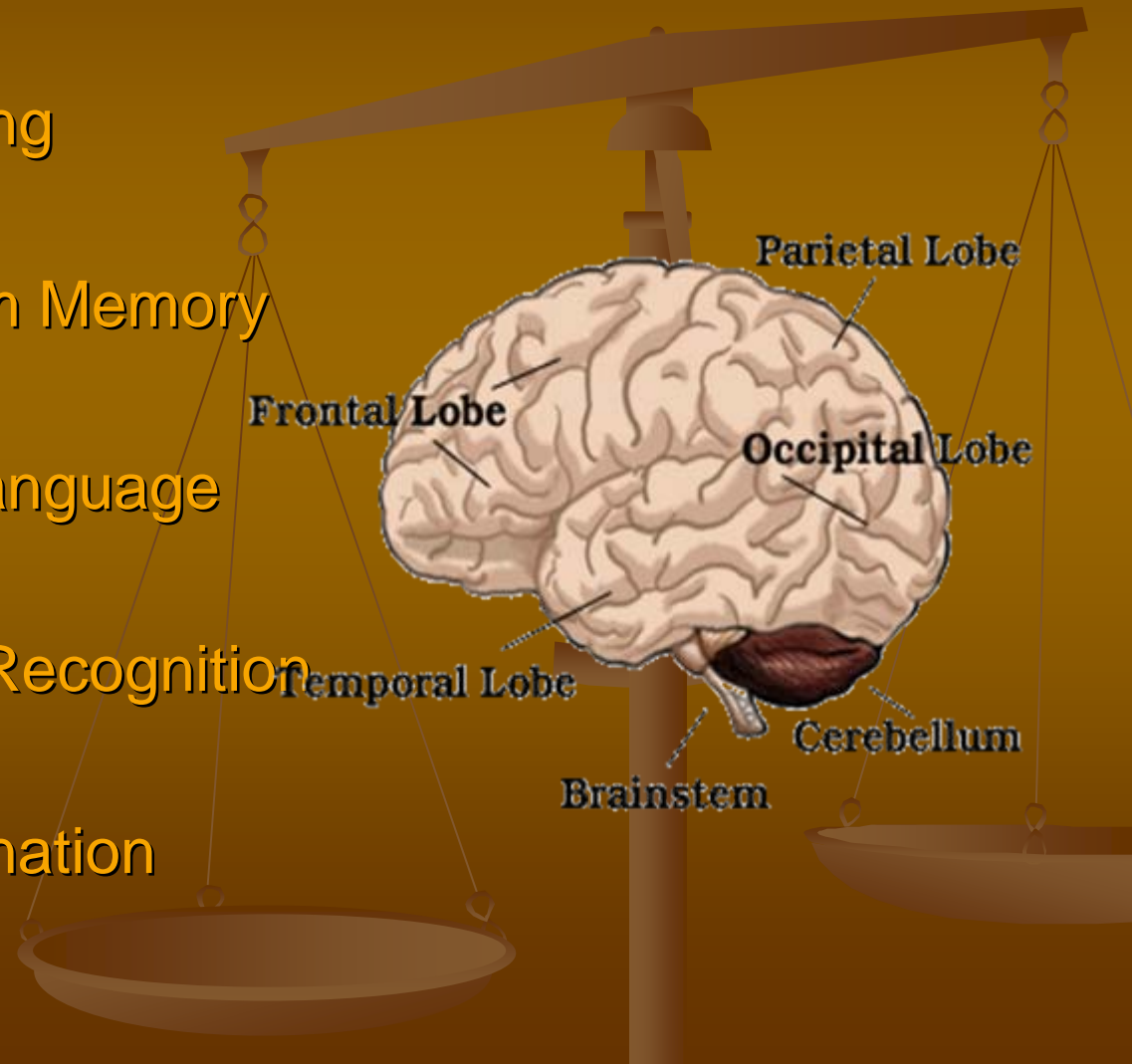
- A single stimulus evokes two or more responses



the  
mind  
is what  
the  
brain  
does

# Basic Neurophysiology

- Frontal Lobe
  - Planning, Organizing
- Temporal Lobe
  - Sorting, Short-Term Memory
- Parietal Lobe
  - Sensory Cortex, Language
- Occipital Lobe
  - Visual Reception, Recognition
- Cerebellum
  - Movement, Coordination



# The Realm of Spirit



# Spirituality and Religion



## ■ What is Spirituality?

- Belief in a power greater than the self
- An aspiration to fulfill our highest potential
- The emphasis is on personal experience

## ■ What is Religion?

- Best viewed as a subset of spirituality
  - Neopagan religions generally do not worship
  - Instead they stress spirituality (experience)

# Faith and Belief



## ■ Faith

- Acceptance of ideals, beliefs, etc., which are not necessarily demonstrable through experimentation or reason.
- Holds the character of an individual in a fixed position when comprehension is not sufficient to release the individual to a full scale relationship with the ideal.

## ■ Belief

- A form of judging something to be true, intermediate between mere opinion and certain knowledge. (Kant)
- Acceptance of a proposition or unproven assertion based on one or more fundamental assumptions.

# Physical and Metaphysical

## ■ Tulpas

- The ancient Tibetans believe that men of enlightenment may manipulate the myriad energies of the cosmos into forms they refer to as *tulpas*.

## ■ Golem

- The ancient Hebrews believed that *golem*, clay sculptures of a human form, could be brought to life by the “hand of GOD.”

**“I am not concerned with beliefs but with the cosmic mechanism which has generated and perpetuated these beliefs.”**

- John Keel, “The Mothman Prophecies”

# The Role of Experience



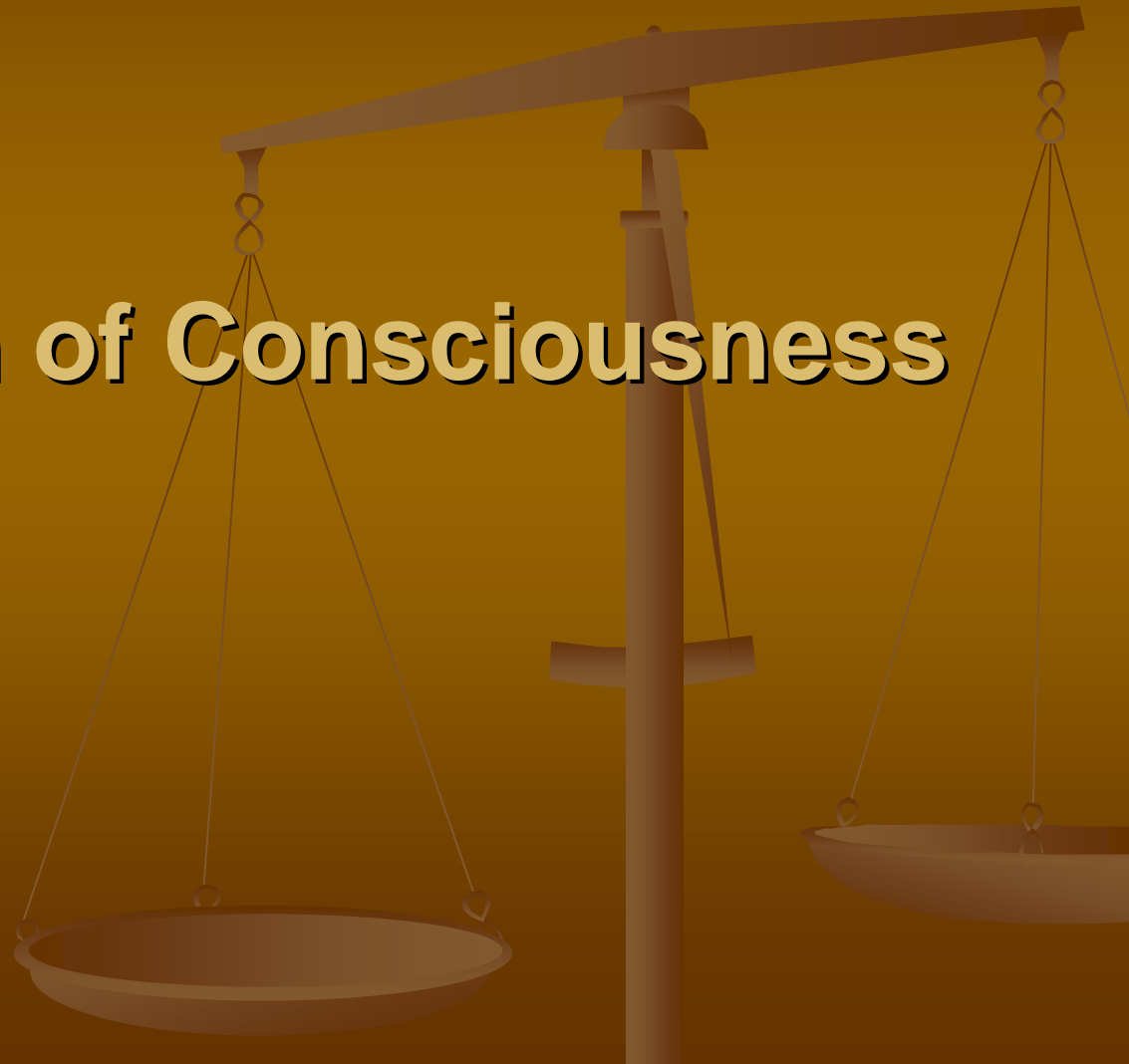
## ■ Experiences of “Self”

- **Spiritual experiences enhance our faith**
  - This deeper faith strengthens our beliefs
- **Spiritual knowledge enhances our belief**
  - These stronger beliefs deepen our faith

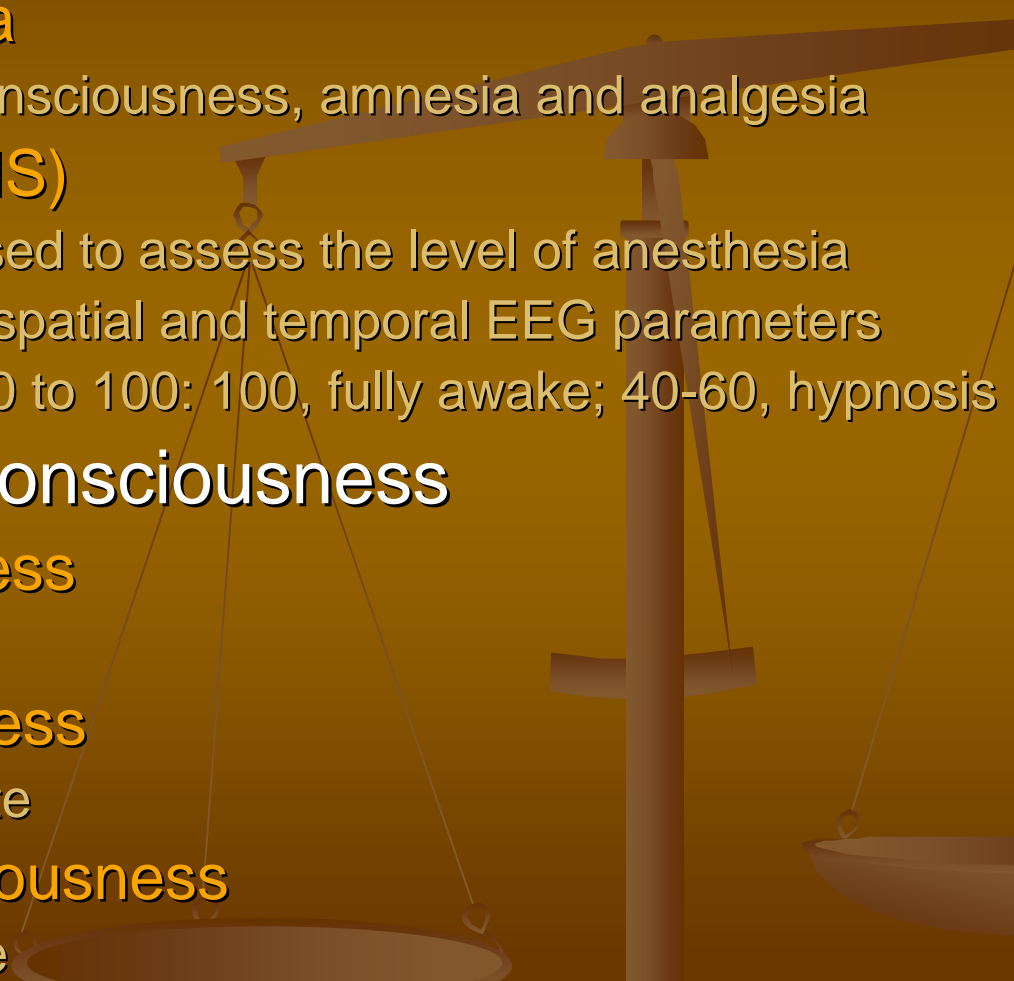
## ■ Experiences of “Others”

- **Teachers are sought out for their unique wisdom**
  - Spiritual Guides and Saints point to the ultimate

# The Realm of Consciousness



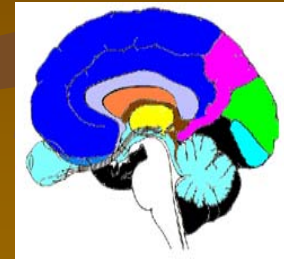
# What is Consciousness?

- **Medical/Quantitative Aspects of Consciousness**
    - **General Anesthesia**
      - Aim to ensure unconsciousness, amnesia and analgesia
    - **Bispectral index (BIS)**
      - Neurophysiology used to assess the level of anesthesia
      - A weighted sum of spatial and temporal EEG parameters
      - Value ranges from 0 to 100: 100, fully awake; 40-60, hypnosis
  - **The Spectrum of Consciousness**
    - **Gross Consciousness**
      - The “waking” state
    - **Subtle Consciousness**
      - The “dreaming” state
    - **Very-subtle Consciousness**
      - The “sleeping” state
- 

# Models of Consciousness

## ■ Physical

- Brain Regions Modeled as Cavity
- Waves Resonate, Interfere, Collapse



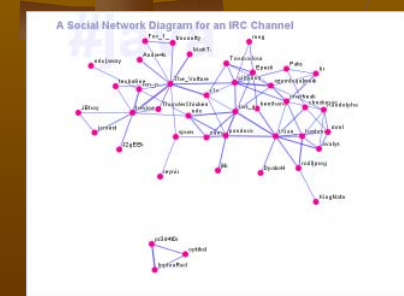
## ■ Biological

- Desires create goals
- Adaptations achieve goals

**“Consciousness is a selecting agency...”**  
-William James

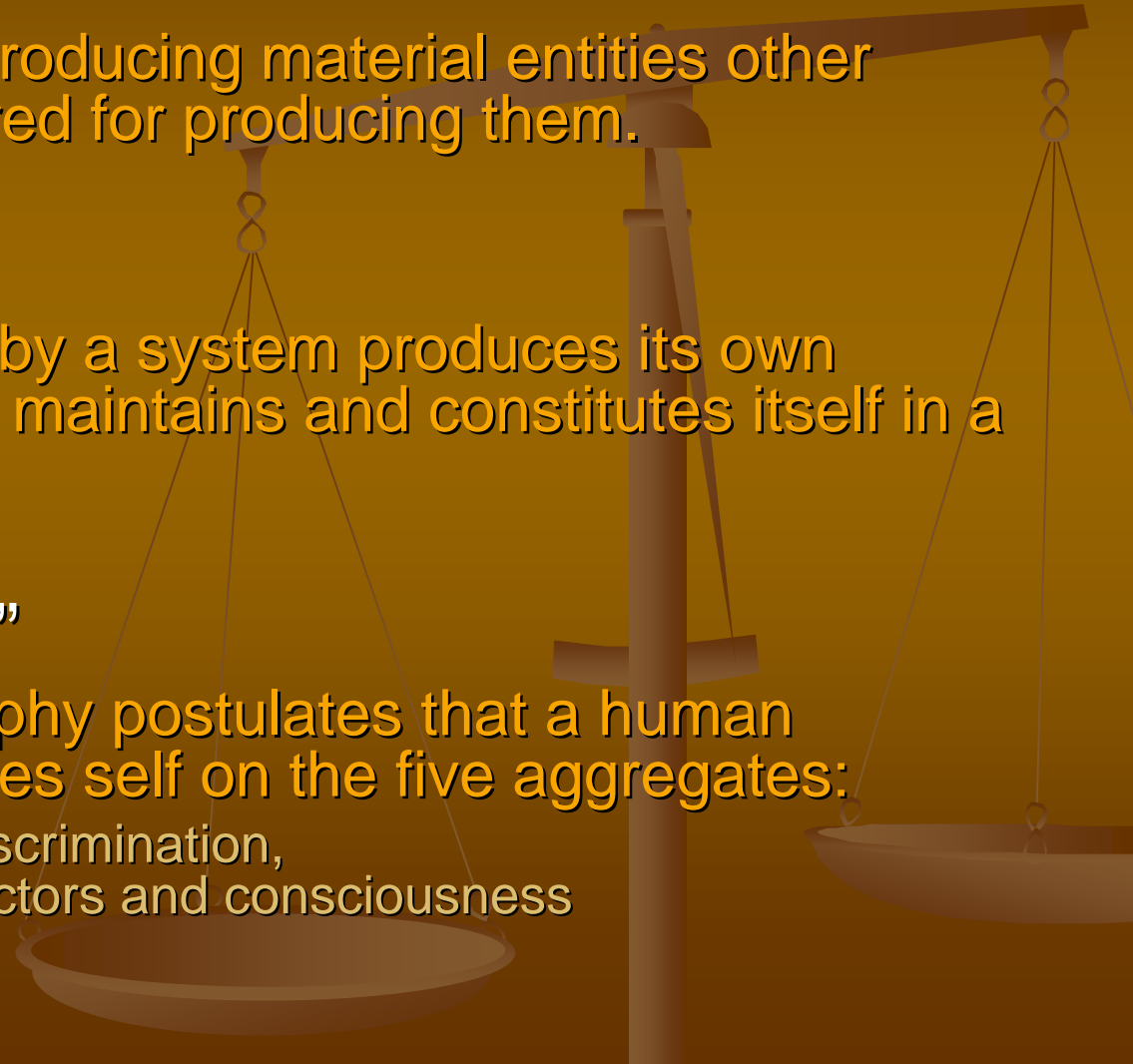
## ■ Social

- Individual attributes
- Interacting social groups



# Self from Consciousness

- Allopoiesis
  - The process of producing material entities other than those required for producing them.
- Autopoiesis
  - A process whereby a system produces its own organization and maintains and constitutes itself in a space.
- The “Aggregates”
  - Buddhist philosophy postulates that a human mistakenly imputes self on the five aggregates:
    - Form, feeling, discrimination, compositional factors and consciousness



# !/? Entangled Brain States ?!

## ■ Experiment (Grinberg-Zyllerbaum)

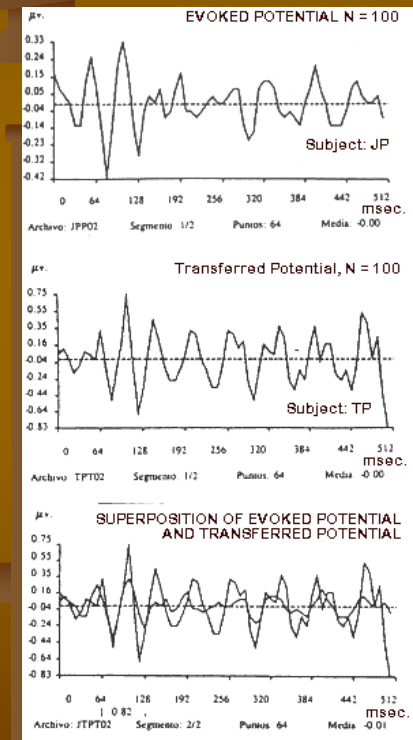
- Subject A and B meditate together
- Subject A then removed
- EEG Recorded for B
- ERP Recorded for A (bright light)

## ■ Results

- Subject B EEG *Correlated* with A
- Correlation far exceeds chance:
  - $R = -0.37$  to  $+0.46$

## ■ Conclusion

- Consciousness of A Supervenes on B



# The Realm of Time



# Thinking About Time

## ■ Archimedes

- “...temporal flux *is not* an intrinsic feature of reality.”

## ■ Aristotle

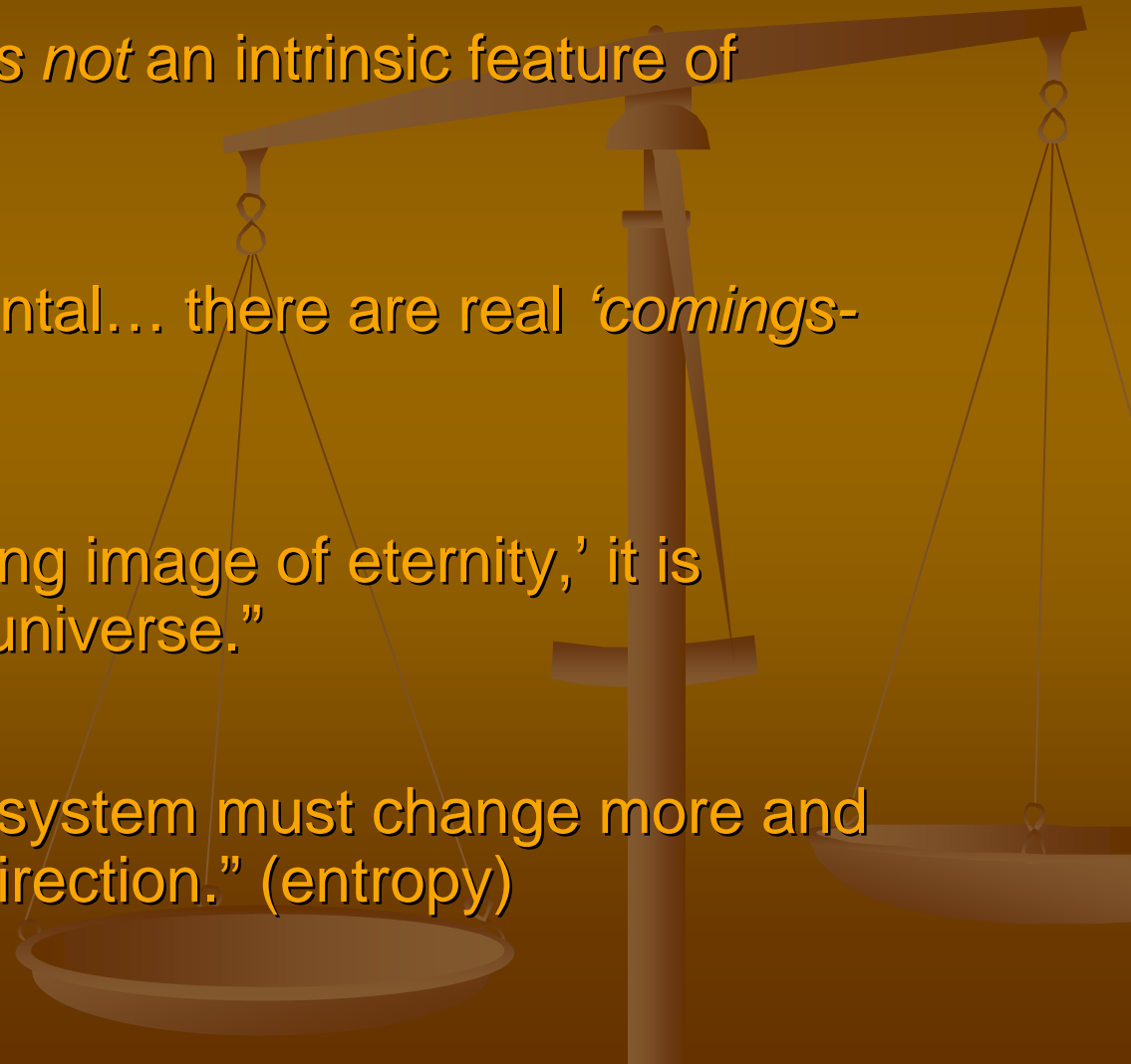
- “Time *is* fundamental... there are real ‘comings-into-being’.”

## ■ Plato

- “...time is a ‘moving image of eternity,’ it is produced by the universe.”

## ■ Claussius

- “... the state of a system must change more and more in a given direction.” (entropy)



# The Passage of Time



- Psychological Time (Subjective)

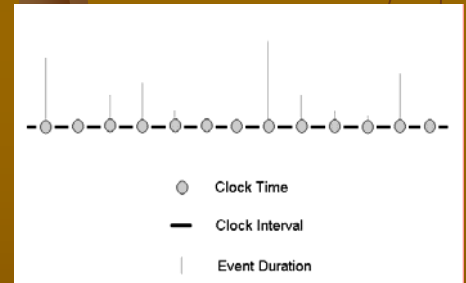
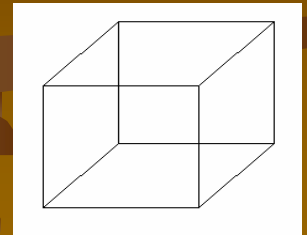
- Francisco Varela: "... the complexity of bringing together and integrating various parts of the brain gives us the sensation of time."

- Physical Time (Objective)

- Albert Einstein: "... all of our judgments in which Time plays a role are always judgments of simultaneous events. ... the time of the event has no operational meaning"

# The Dimensionality of Time

- Theory of Visual Perception (Dobbs)
  - Reversal of Perspective (Necker Cube)
  - Two times: 'transition time', 'phase time'
- Theory of Time Perception (James)
  - Time is objective and subjective
  - Sub. time perpendicular to obj. time
- Some Meta-Meta-Physics
  - 'Space' is Occupied by 'Matter'
  - 'Time' is Occupied by 'Consciousness'



**“What is the dimensionality of a thought?”**

# Time in Consciousness

## ■ Mind Consciousness

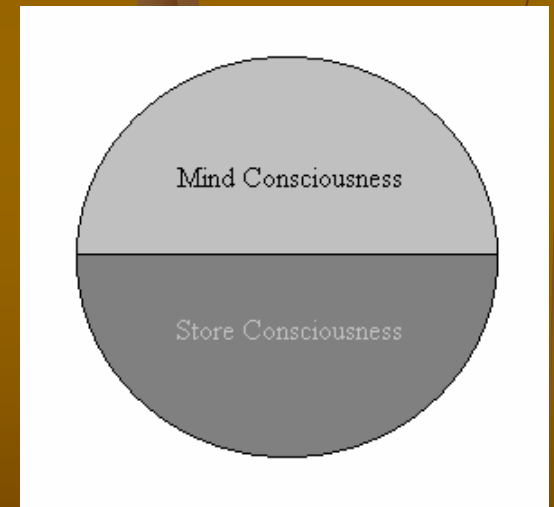
“[A] state of consciousness lasts as long as the combination of single factors. This represents the limitation of consciousness by time.”

- *Dhammasangani*

## ■ Store Consciousness

“Consciousness presents itself as ‘connecting,’ because when any later state of consciousness arises, it does so by immediately succeeding the preceding state.”

- *Atthasalini*



**Conclusion**



# Questioning Consciousness



- How/where does consciousness occur?
  - Is there a neural correlate of consciousness?
    - Is it distributed or localized?
- How does evolution explain altruism?
  - Is there a genetic basis for altruistic behavior?
    - Are mutations random or directed?
- What does it feel like to see blue?
  - Is consciousness only experiential (qualia)?
    - Does personal and private mean un-measurable?

# What can we know?

- We are Homo Sapien Sapien
  - This means “knowing and knowing that we know”
- Epistemology
  - From the Greek words *episteme* (knowledge) and *logos* (word/speech) is the branch of philosophy that deals with the nature, origin and scope of knowledge.
- What is knowable?
  - How are you asking? (method, theory, framework)
  - Who is asking? (self, other, whole)

**“Words are only an attempt to represent reality they are not reality itself.”**

- Kevin Griffin, “One Breath at a Time: Buddhism and the Twelve Steps”

# Uncertainty and Incompleteness



## ■ Heisenberg's Uncertainty Principle

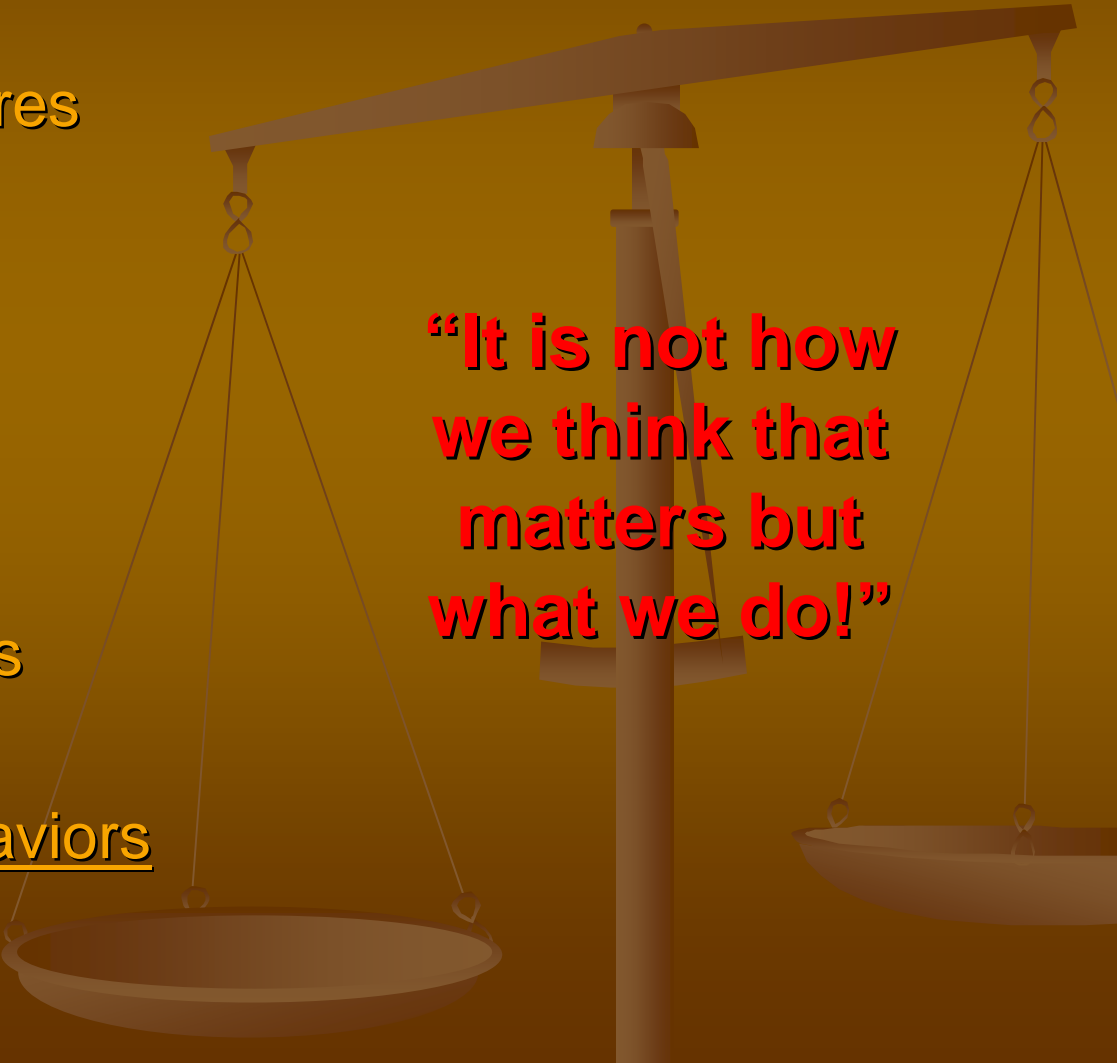
- If one measures the position of a quantum mechanical object very precisely it is impossible to also determine its velocity with a high degree of precision.
  - This is a consequence of the way all signals are measured.

## ■ Gödel's Incompleteness Theorem

- For any self-consistent recursive axiomatic system of integer arithmetic there are true propositions about integers that can not be proven from the axioms.
  - Within every theory there are statements that are true but that cannot be proven to be true.

# The “Evolution” of Thought

- Adaptation
  - Thoughts to Desires
- Acquisition
  - Desires to Skills
- Application
  - Skills to Tools
- Abstraction
  - Tools to Concepts
- Assimilation
  - Concepts to Behaviors



**“It is not how  
we think that  
matters but  
what we do!”**