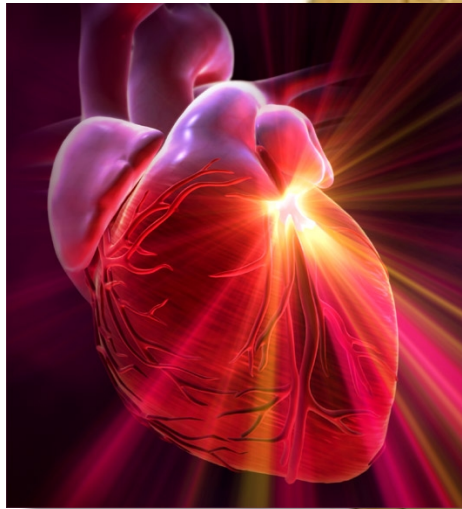


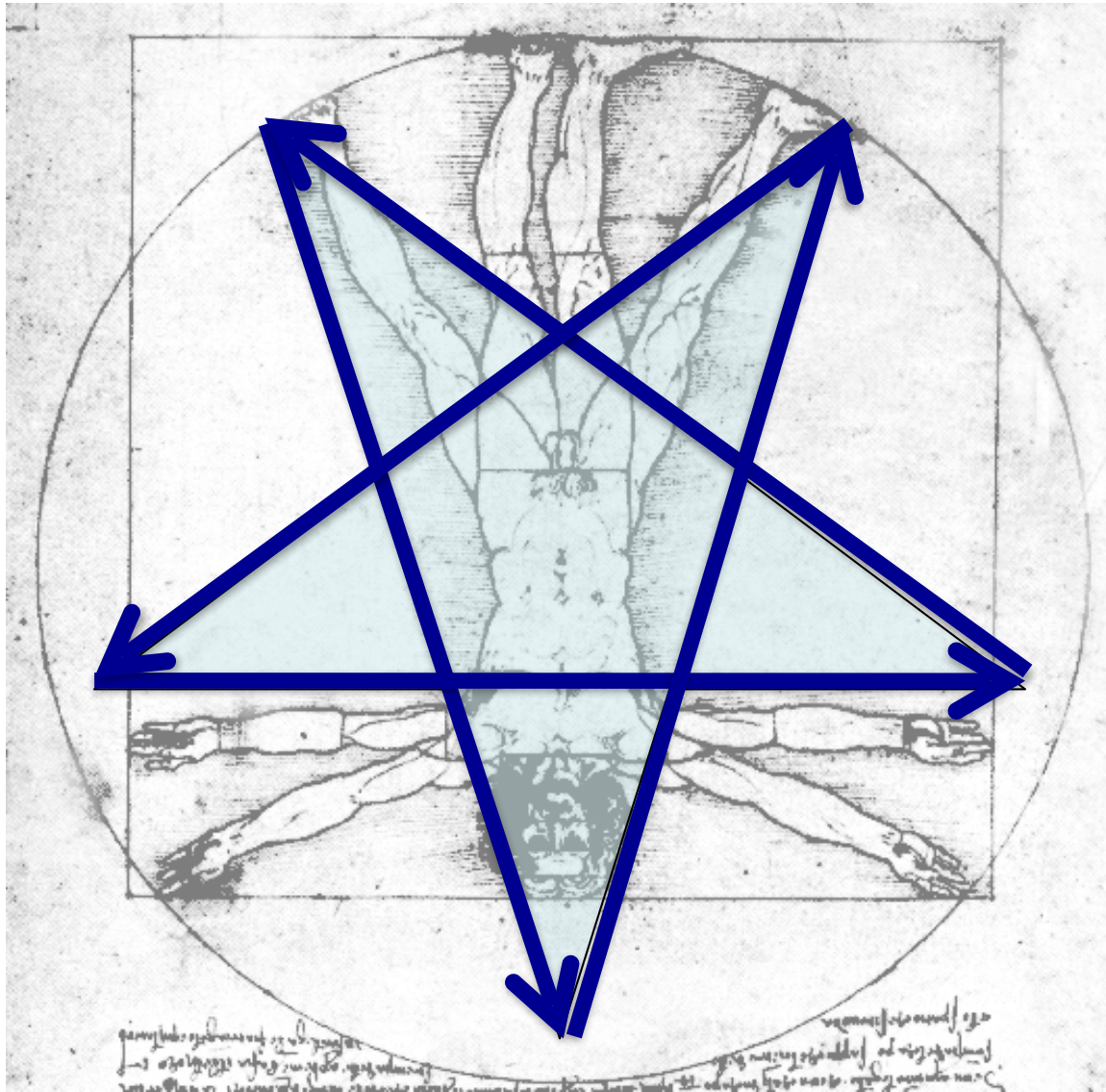
THREE BRAINS ARE BETTER THAN ONE: Integrating Brain, Body and Heart Intelligences



Presented by
Tim Burns

Santa Fe, New Mexico, USA
www.TimBurnsEducare.com

Star Walk



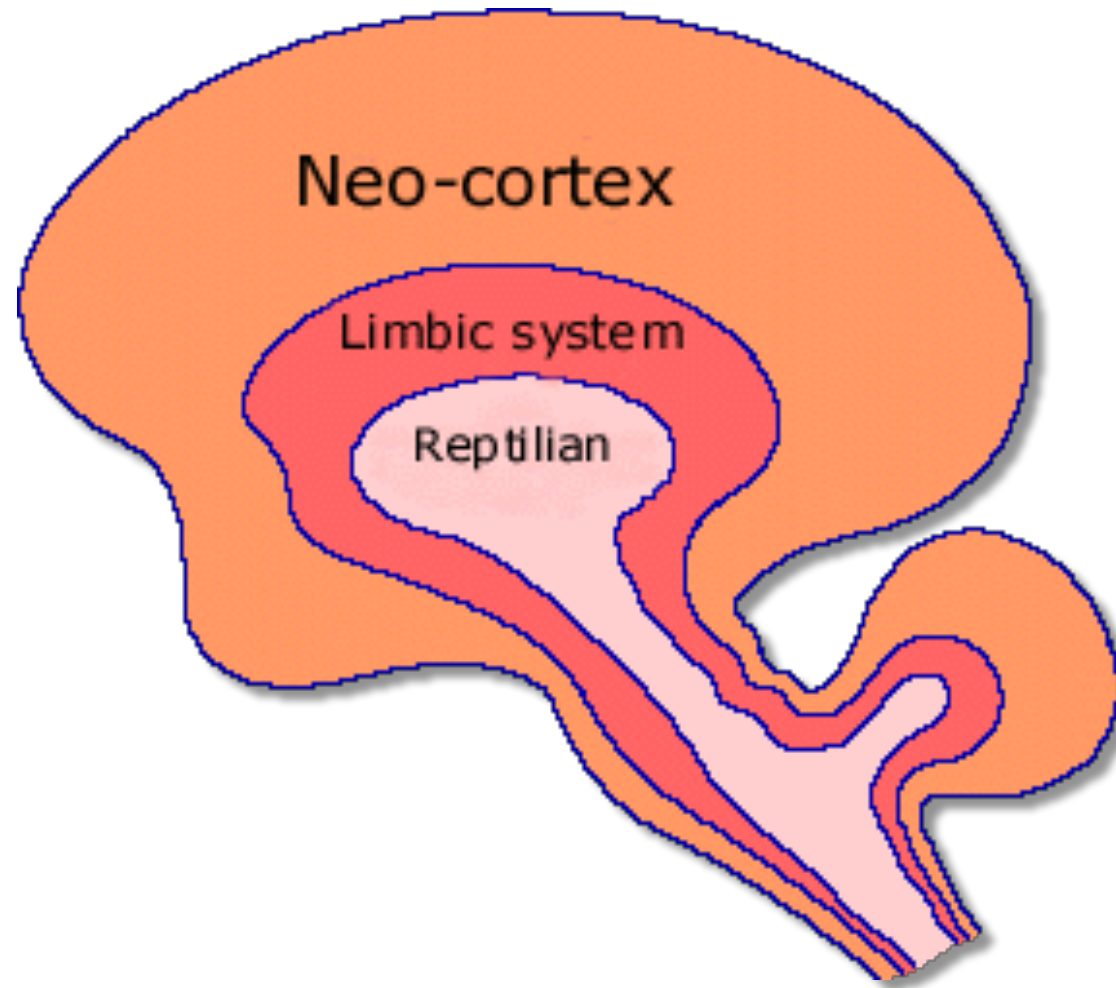
www.TimBurnsEducare.com

STRUCTURE of COGNITIVE LEARNING

1. Stimulus of the model.
2. Practice, repetition, variation.
3. Application or generalization.

Burton White
Harvard Preschool Project
Raising a Happy, Unspoiled Child, 1995)

TRIUNE BRAIN



Paul MacLean, M.D.,
Chief of the Laboratory of Brain Evolution and Behavior, NIMH

The Triune Brain

Low brain

Focus on threat

Mid-brain

Focus on relationship

High brain

Seeks novelty, challenge &
feedback

THE TRIUNE BRAIN

Three Non-Negotiable Requirements

NURTURE



**“STATE
REGULATION”**

FEEDBACK

PLAY

Stephen Porges, Ph.D.
The Polyvagal Theory

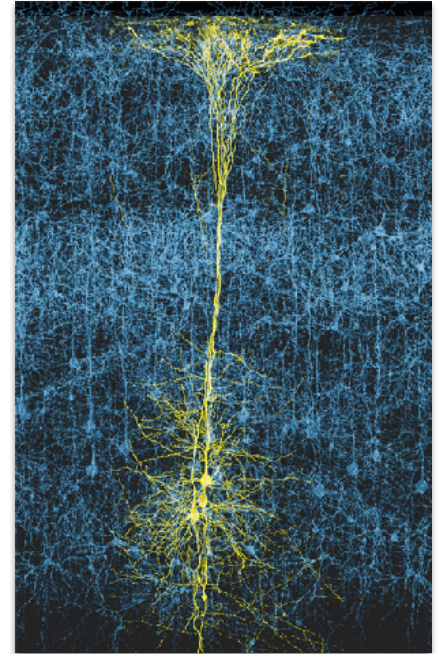
Brain Enriching Environments: *The Basics*

Absence of threat

Novelty

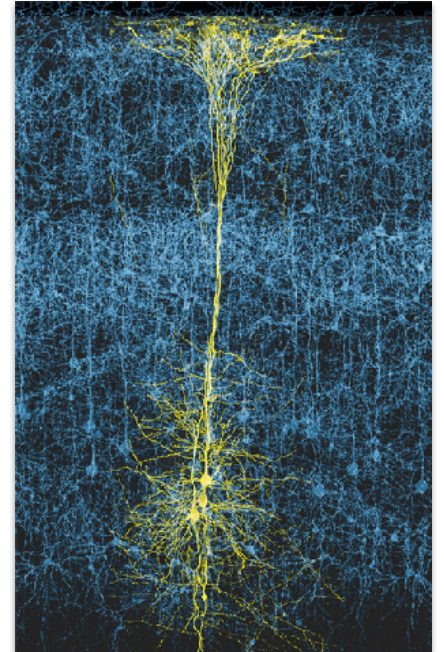
Feedback

Challenge

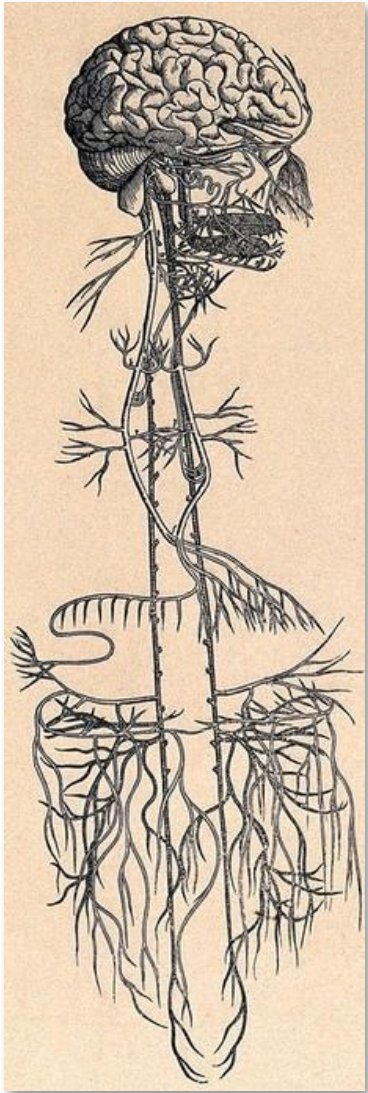


Findings: Brain Enriched Environments

- **New synaptic connections**
- **New neural networks**
- **Larger cell bodies**
- **Greater dendritic branching**
- **Enhanced glial production**
- **Increased quantity of synapses**
- **Multiple contact areas**
- **Increased neurogenesis at multiple brain sites**



VAGUS NERVE



Vagus nerve

Activates the PNS (80%)

Releases serotonin

95% found in bowels

Arrives in brain in 20 seconds

**Activates alpha/theta
brain waves**

P.A.C.E the brain

**Mindful (diaphragmatic)
breathing**

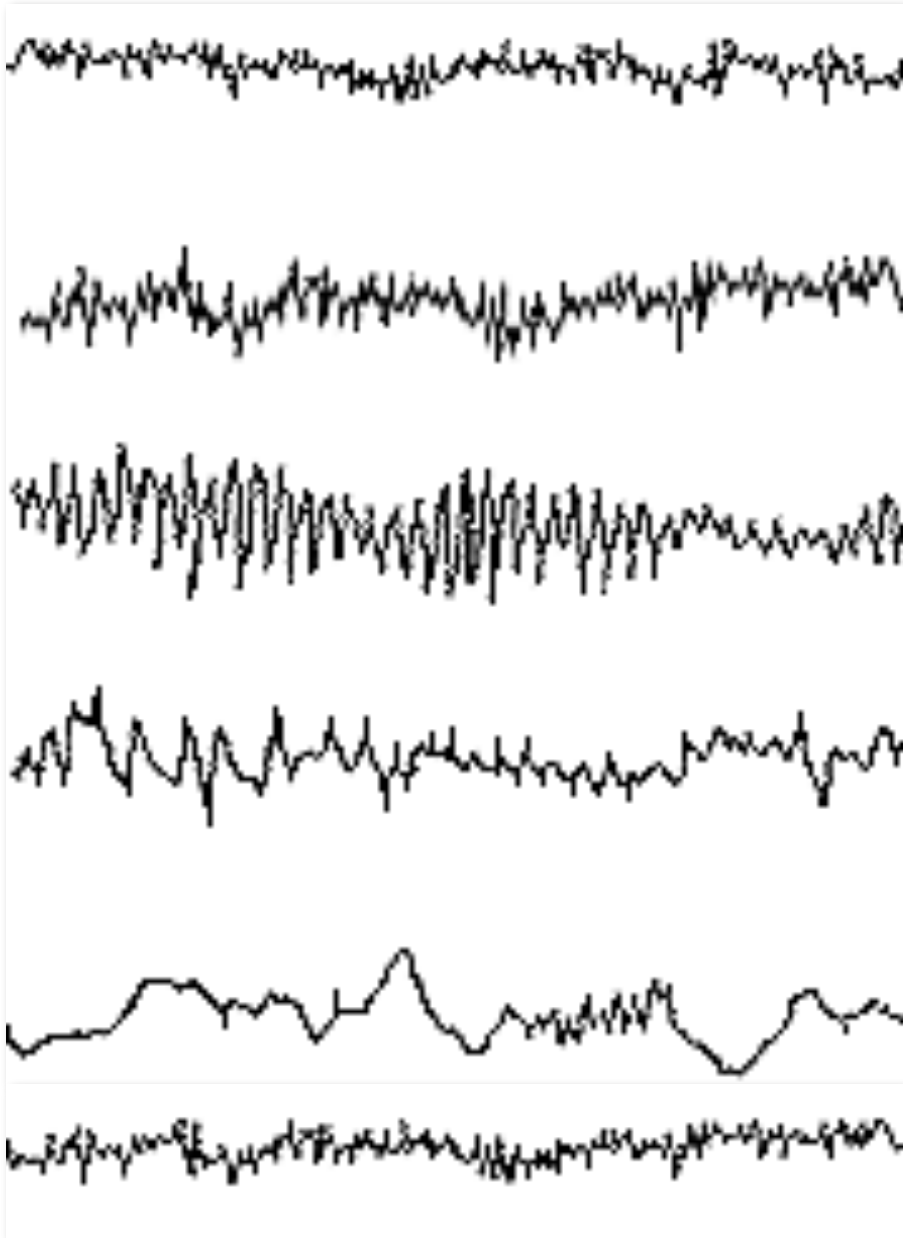
BRAIN STATES DURING CHILDHOOD

“EEG activity in children reveals, at every developmental stage, the predominance of a specific brainwave.”

Bruce Lipton, Ph.D.
Molecular biologist
The Biology of Belief

BRAIN-MIND STATES

EEG Brain Wave Activity



Gamma - 25-100 Hz (40hz typical).
Binds conscious perception

Beta – 13-30 Hz. Active, alert,
concentration

Alpha – 9-13 Hz. Relaxed focus, light
trance, enhanced serotonin
production

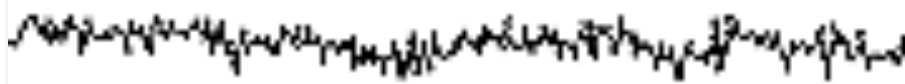
Theta – 4-8 Hz. Trance-like state;
enhanced catecholamine aids
retention of learning

Delta – 1-3 Hz. Dreamless sleep;
HGH produced

REM – Rapid Eye Movement;
dreaming

BRAIN-MIND STATES

EEG Brainwave Activity



Gamma - 25-100 Hz (40hz typical).
Binds conscious perception



Piaget: Formal Operations alert,



Piaget: Concrete Operations in

Alpha - 8-12 Hz Delayed focus, light
production



Piaget: Pre-operational nine aids

Theta - 4-8 Hz Trance-like state;
retention of learning



Piaget: Sensori-motor stage sleep;



REM - Rapid Eye movement,
dreaming

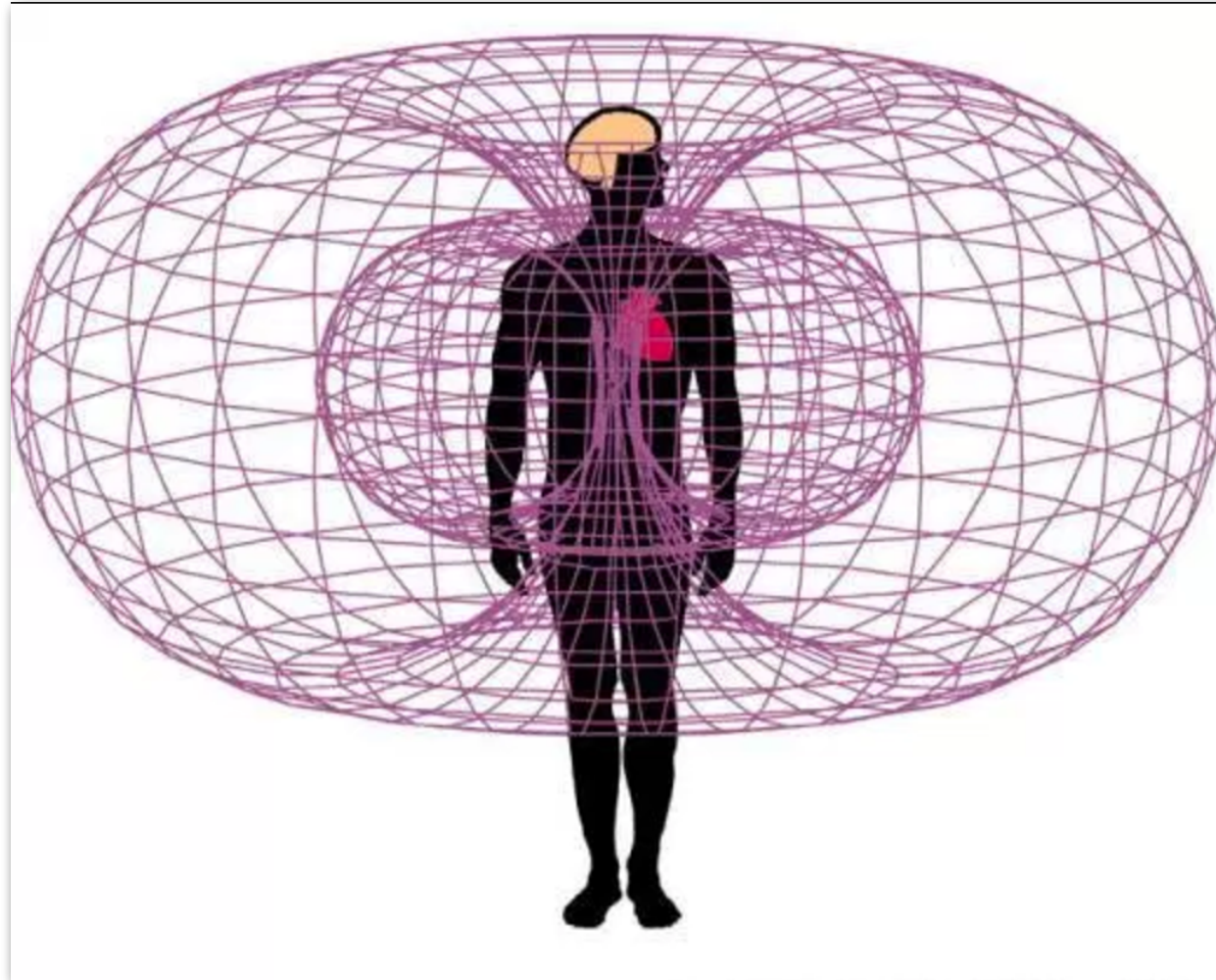
FRAMEWORK FOR BRAIN-BASED CHILDHOOD DEVELOPMENT

| | Brain Stage | Intelligence Domain | Piaget | Erickson Virtues | Maslow Needs | Kohlberg Moral | Steiner Spiritual |
|---------------|--|--|---|---|---|--|------------------------------|
| Mature Adult | <i>Brain-Heart Integration</i> | <i>Heart: Wisdom and Compassion</i> | <i>Post-formal operations</i> | <i>Care/Wisdom: Generativity vs. Stagnation/ Integrity vs. despair</i> | <i>Self-actualization: morality, creativity, acceptance</i> | <i>Post-conventional: principled conscience universal ethic</i> | <i>Spiritual orientation</i> |
| Teen - Adult | <i>Neo-mammalian: Frontal cortex Teen to Adult</i> | <i>Thought: Abstraction & Meaning-making</i> | <i>Formal operations</i> | <i>Fidelity: Identity vs. Role confusion Love: Intimacy vs. Isolation</i> | <i>Esteem orientation: confidence, achievement, respect for & by others</i> | <i>Conventional: social-contract to Post-conventional</i> | <i>Soul orientation</i> |
| 6/7 - Puberty | <i>Neo-mammalian: Posterior cortex Ages 6- 11/12</i> | <i>Thought: Concrete & Problem-solving</i> | <i>Concrete operations</i> | <i>Purpose: Initiative vs. Guilt Competence: Industry vs. Inferiority</i> | <i>Belonging orientation</i> ----- <i>Esteem orientation</i> | <i>Conventional: conformity authority social-order maintenance</i> | <i>Truth orientation</i> |
| 2 - 6/7 | <i>Paleo-mammalian: Limbic system Ages 2 - 6</i> | <i>Social-Emotional: Relationship</i> | <i>Pre-operational "The dreaming child"</i> | <i>Will: Autonomy vs. Shame & Doubt</i> | <i>Love and affection orientation</i> | <i>Pre-conventional: punishment & obedience</i> | <i>Beauty orientation</i> |
| Birth - 2 | <i>Reptilian: Brain stem/ Cerebellum Birth - 2</i> | <i>Body: Self-preservation</i> | Sensory-motor | <i>Hope: Trust vs. Mistrust</i> | <i>Survival and Safety orientation</i> | <i>N.A.</i> | <i>Goodness orientation</i> |

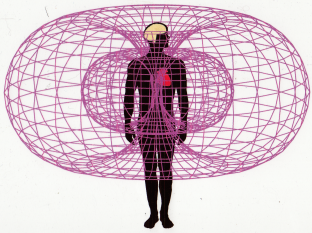


THE “HEART BRAIN”

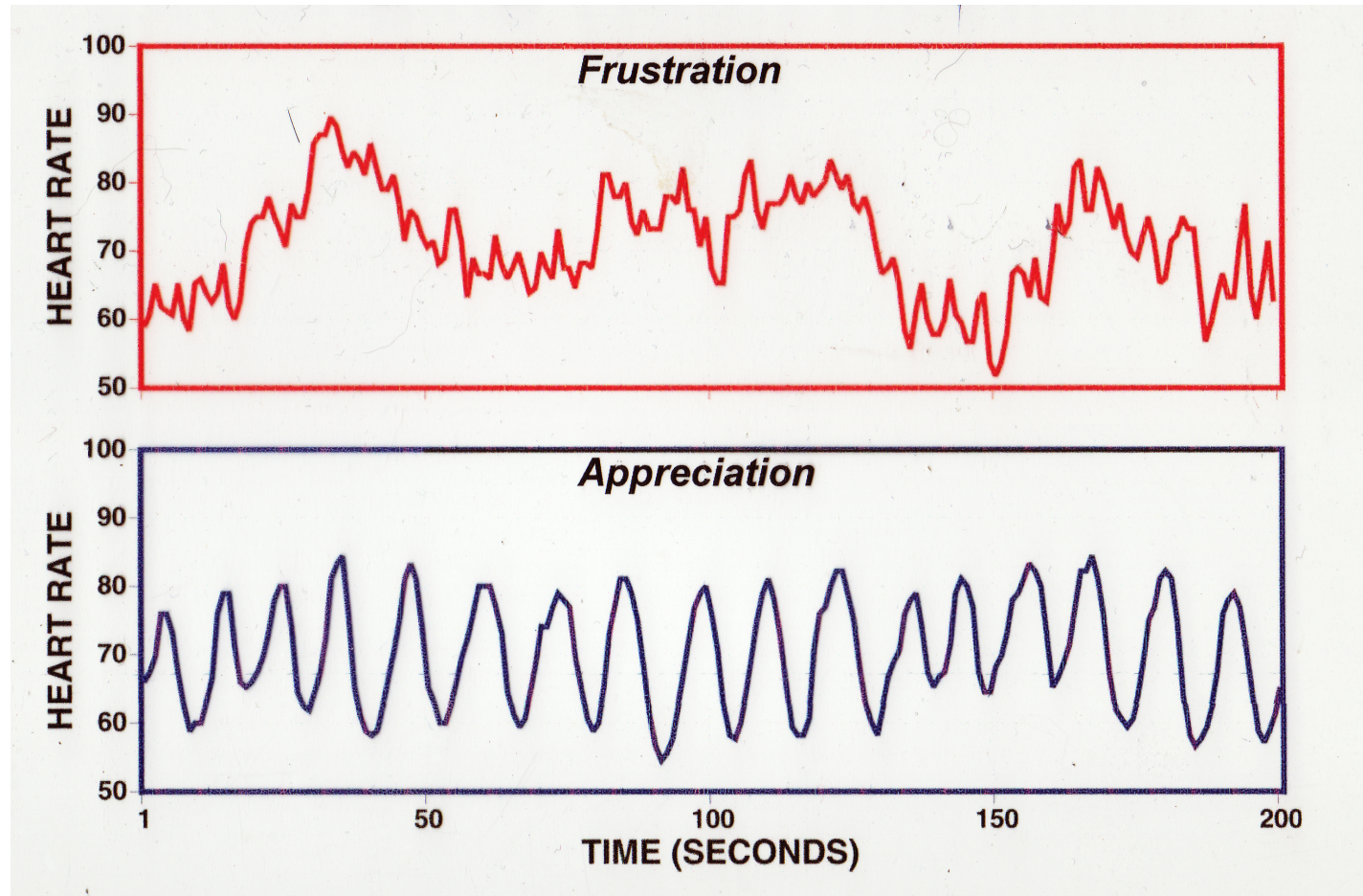
Biophysics of the Heart

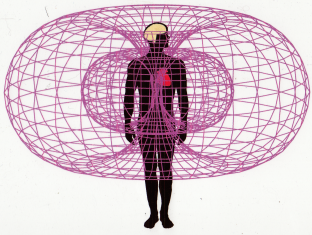


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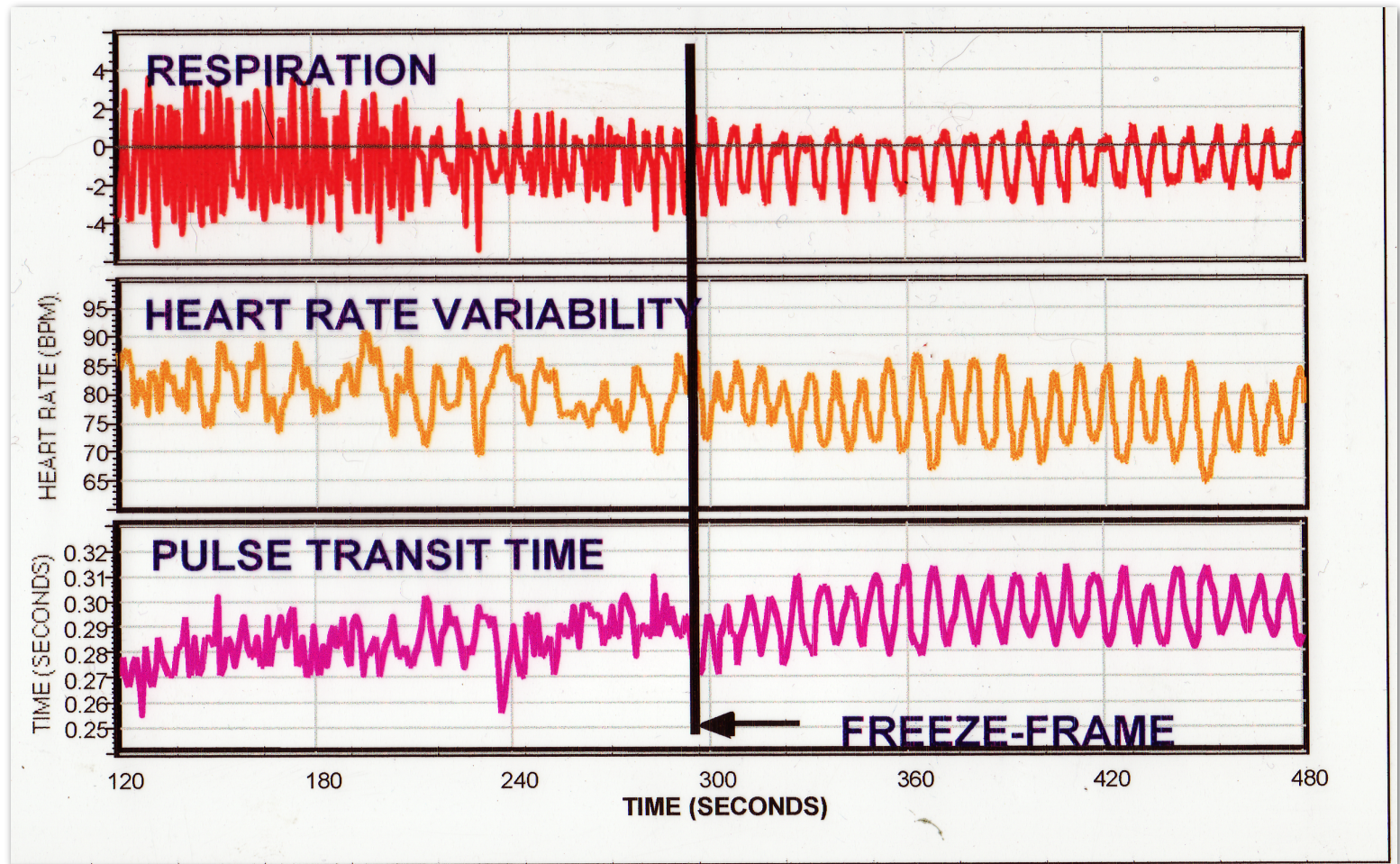


Emotions and “Heart Waves”



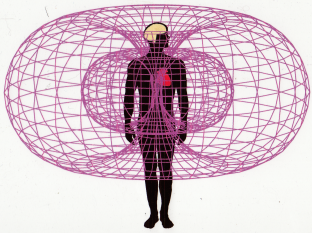


Emotions and “Heart Waves”



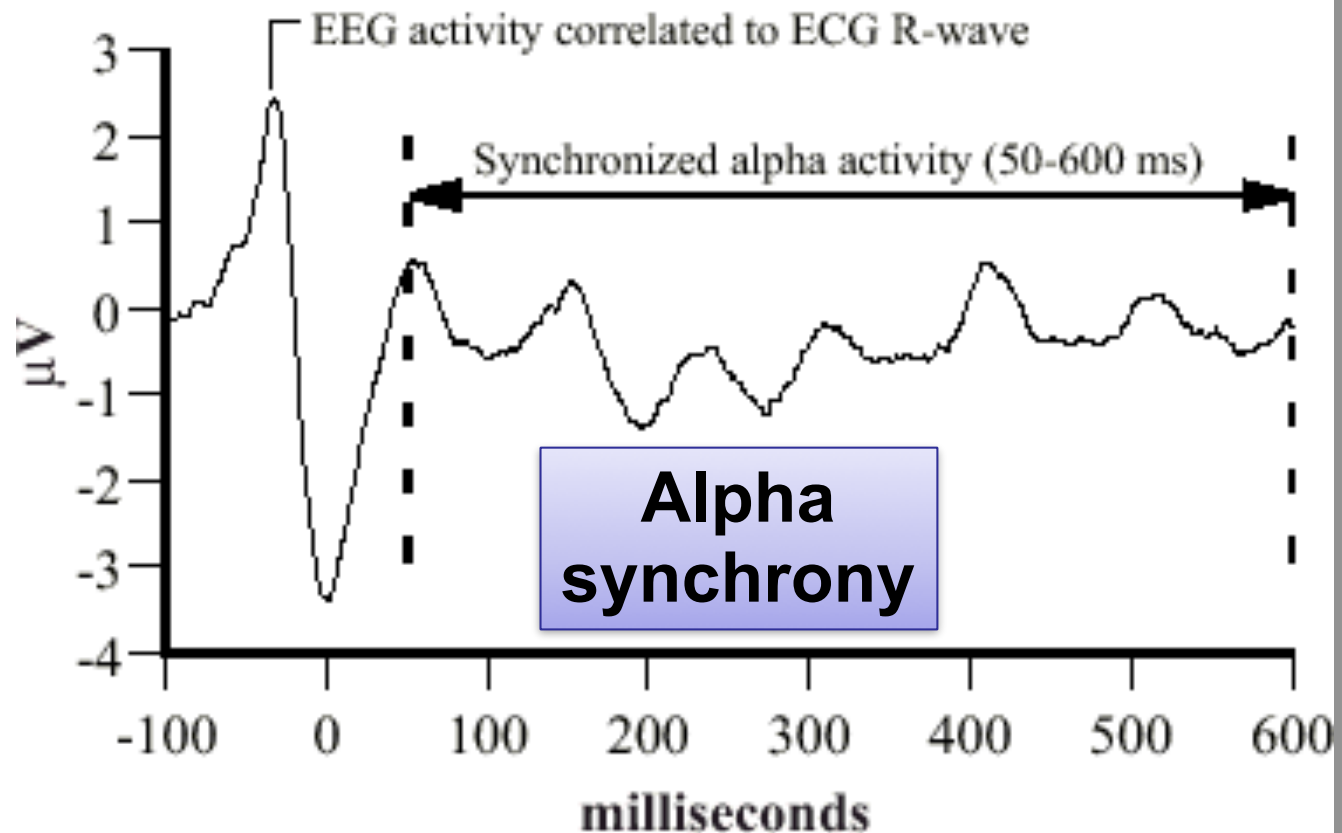
Incoherence

Coherence



Brain Waves and “Heart Waves”

The Brain’s Response to the Heart’s Signals Alpha Rhythm–ECG Synchronization



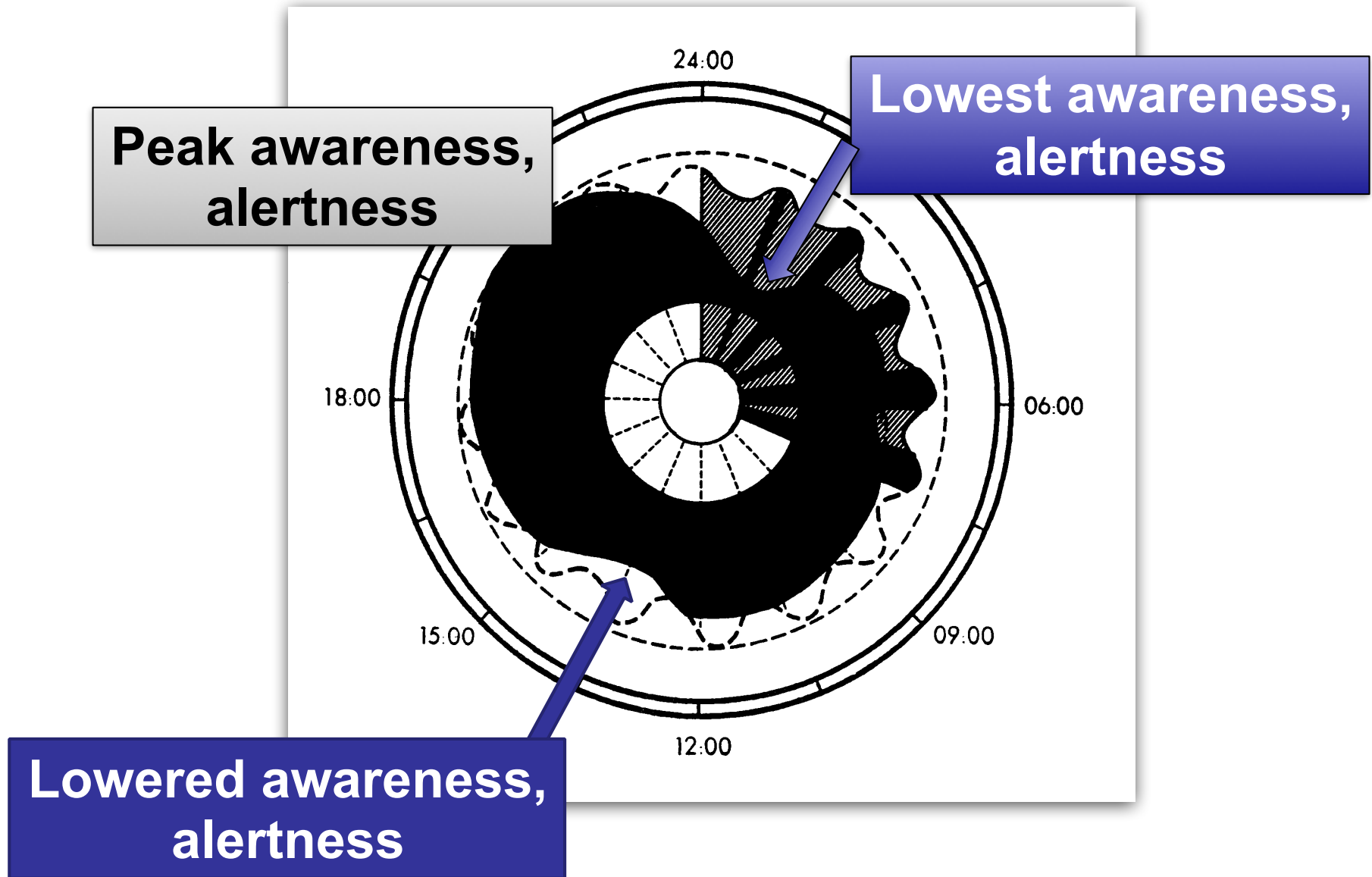
CHRONOBIOLOGY



Infradian
Circadian
Ultradian

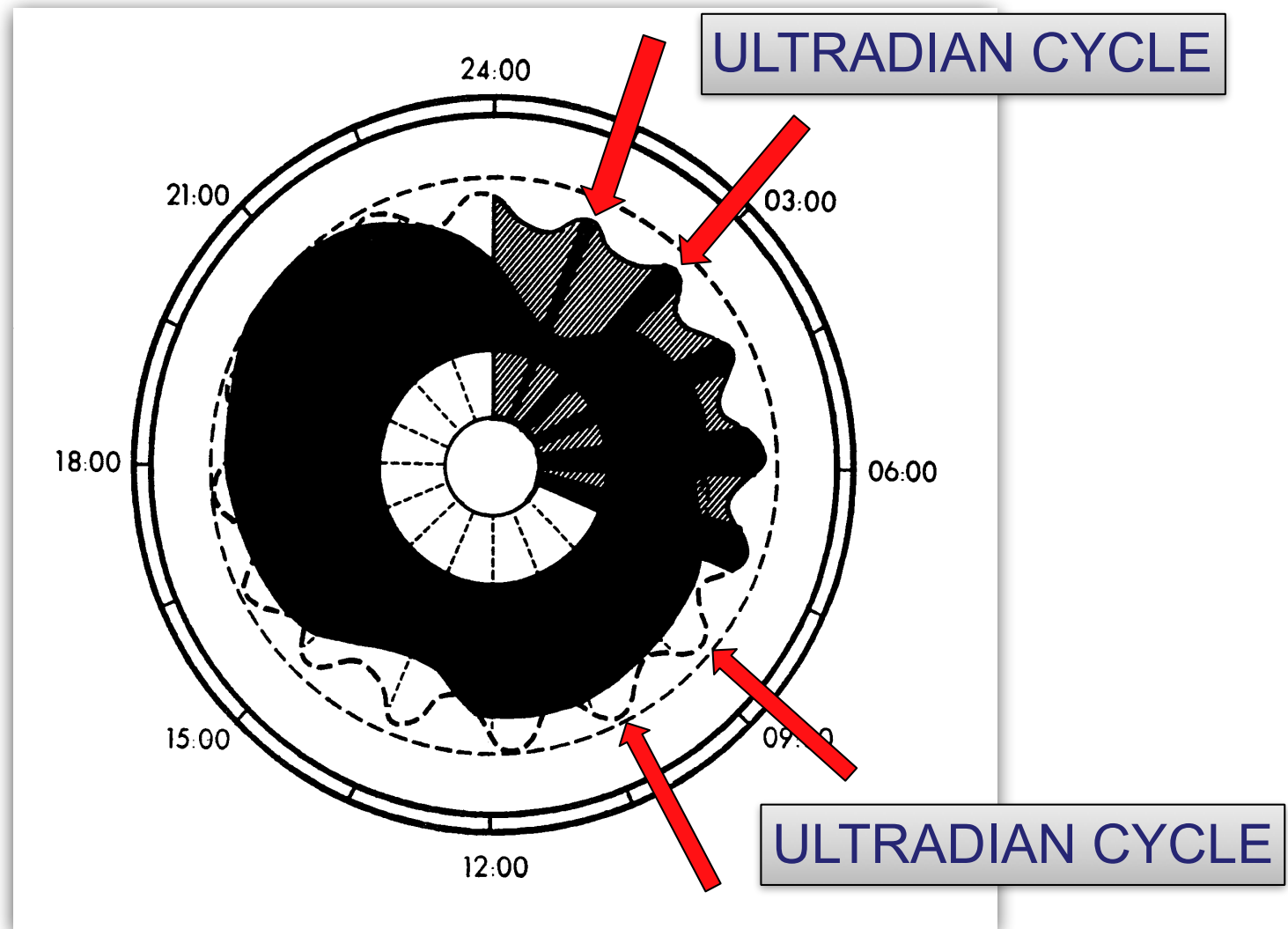
Hastings, Michael, "The Brain, Circadian Rhythms, and Clock Genes."
Clinical Review. BMJ 317:1704-1707, 19 Dec 1998.

BIORHYTHMIC VARIATIONS in the Circadian Cycle



Source: R. Broughton. "Biorhythmic Variations in Consciousness and Psychological Functions." *Canadian Psychological Review*, 1975; 16: 217-239.

BIORHYTHMIC VARIATIONS in the Circadian Cycle



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