

MIND is one key to Six Gigantic Changes Coming to All Humans:

- Four Great Fears (“Existential Threats”)

See build-a-world.org

- Internet/AGI/IOT if we fail to reach Sustainable Intelligent Internet (SII) --- **Depends on mind, intelligent systems**
- Climate extinction, all of our species and many others
- Misuse of nuclear tech, or biotech (e.g. werbos.com/NATO_terrorism.pdf)

- Two Great Hopes

- Quantum leap in attaining human potential, including our **connections to each other & our noosphere (soul)**
- Economically sustainable settlement of space (e.g. NSS)

Consciousness from Brain to Physical Reality & Soul: Unified view (See [youtube watch?v=tIAtE4vdiN0](https://www.youtube.com/watch?v=tIAtE4vdiN0))

Person To Be Healed
A fully connected open system

SOUL

Most People view it as a crucial aspect
which needs to be considered

But cultural schisms must be accounted for

ENDOCRINE SYSTEM

Hormones
affect all and
are affected

NERVOUS SYSTEM

Central Nervous System CNS

Brain

Upper brain (cortex++)

Midbrain,.. Cerebellum++

Spine

Peripheral Nervous System

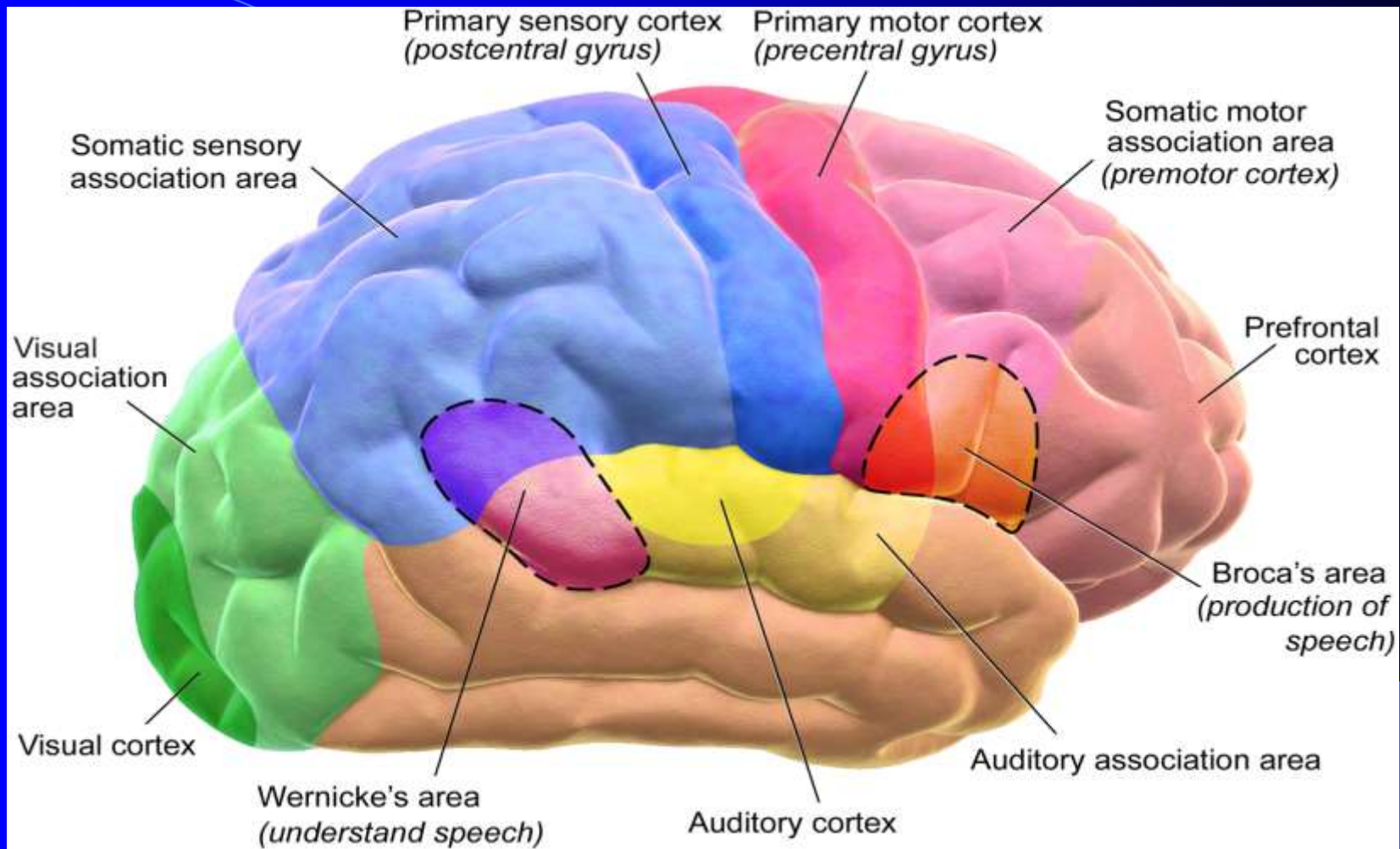
PNS

IMMUNE SYSTEM

Learns to
recognize
bad stuff

Is This How Brains Work?

Just a collection of specific apps, modules?

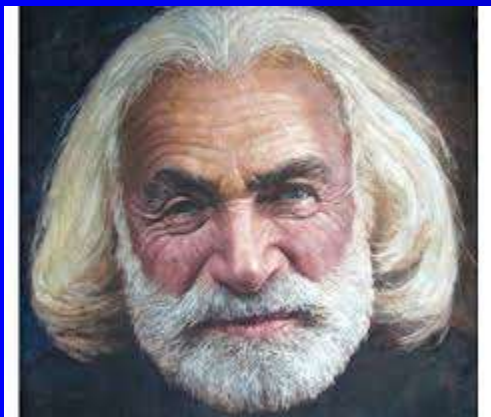


Brain = Universal learning machine



KARL LASHLEY,
The Darwin of neuroscience:
Mass Action In Neocortex

- 2 Key followers: Karl Pribram, Walter Freeman, whom I partnered with



[www.youtube.com/
watch?nqF__KofTZE](http://www.youtube.com/watch?nqF__KofTZE)

Never forget the grand challenge
for this century!

Reinforcement



Sensory Input

Action

Brain As Whole System Is an Intelligent Controller

- Mouse maximizes probability of survival among other things
 - Lots of animal behavior research
- Lots of recent motor control research (UCSD...)

Levels of Consciousness qua Intelligence in Brains

⋮ ?

Human



Symbolic

Mammal

Bird

Reptile

⋮

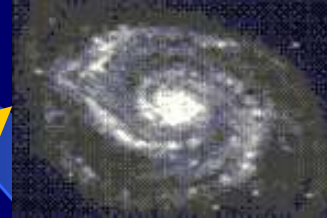
From 1999 First International Conference on Consciousness,
<https://arxiv.org/abs/q-bio/0311006>

True Artificial General Intelligence (AGI) makes DECISIONS Based on foresight and understanding by neural network & Values U/J (as do brains, alpha Go)

See COPN

at www.nsf.gov

Important future applications



Space



Sustainability



Human Potential



Memory

Clustering

...

Prediction

$$\Pr(A|B) = \Pr(B|A) \frac{\Pr(A)}{\Pr(B)}$$

Optimal Decision

$$J(t) = \text{Max} \langle J(t+1) + U \rangle$$

$$\frac{\partial^+ z_n}{\partial z_i} = \frac{\partial z_n}{\partial z_i} + \sum_{j=i+1}^{n-1} \frac{\partial^+ z_n}{\partial z_j} \frac{\partial z_j}{\partial z_i}$$

Von Neumann U = telos

Adaptive Dynamic Programming (RLADP) maximizes utility over time funded by NSF Engineering 1988-2021

Model of reality

Utility function U

Dynamic programming

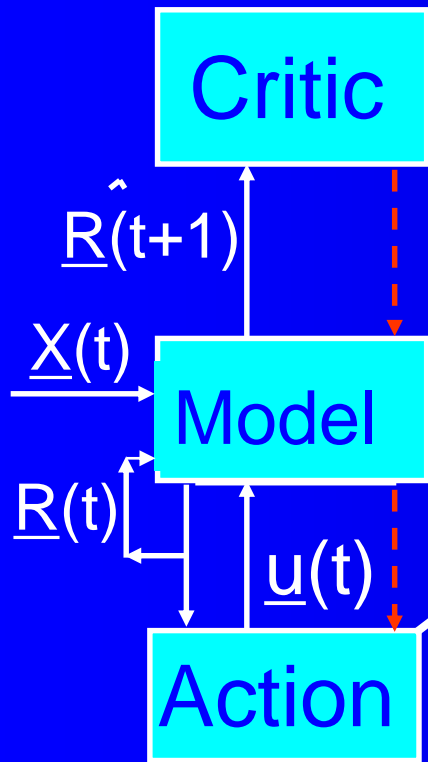
$$J(\mathbf{x}(t)) = \underset{\mathbf{u}(t)}{\text{Max}} \langle U(\mathbf{x}(t), \mathbf{u}(t)) + J(\mathbf{x}(t+1)) \rangle / (1+r)$$

Secondary, or strategic utility function J

Bellman equation:
The stochastic
case as needed
to maximize the
probability of
survival

**Grid is more complex than Alpha Go:
Requires Lewis and Liu, RLADP Handbook, IEEE**

WCCI2014 Beijing: A Roadmap to Mammal Level AGI in Classical Computing



0. Vector Intelligence –
HDP, DHP, GDHP, etc.

1. First ever system which
learned master class chess
Fogel, Proc IEEE 2004



Add new spatial
complexity logic
(ObjectNets + ...,
Suitable for CNNs)

Add ability
to make
Decisions, plays
(Modified
Bellman eqs
for Multiscale t.)

2. reptile

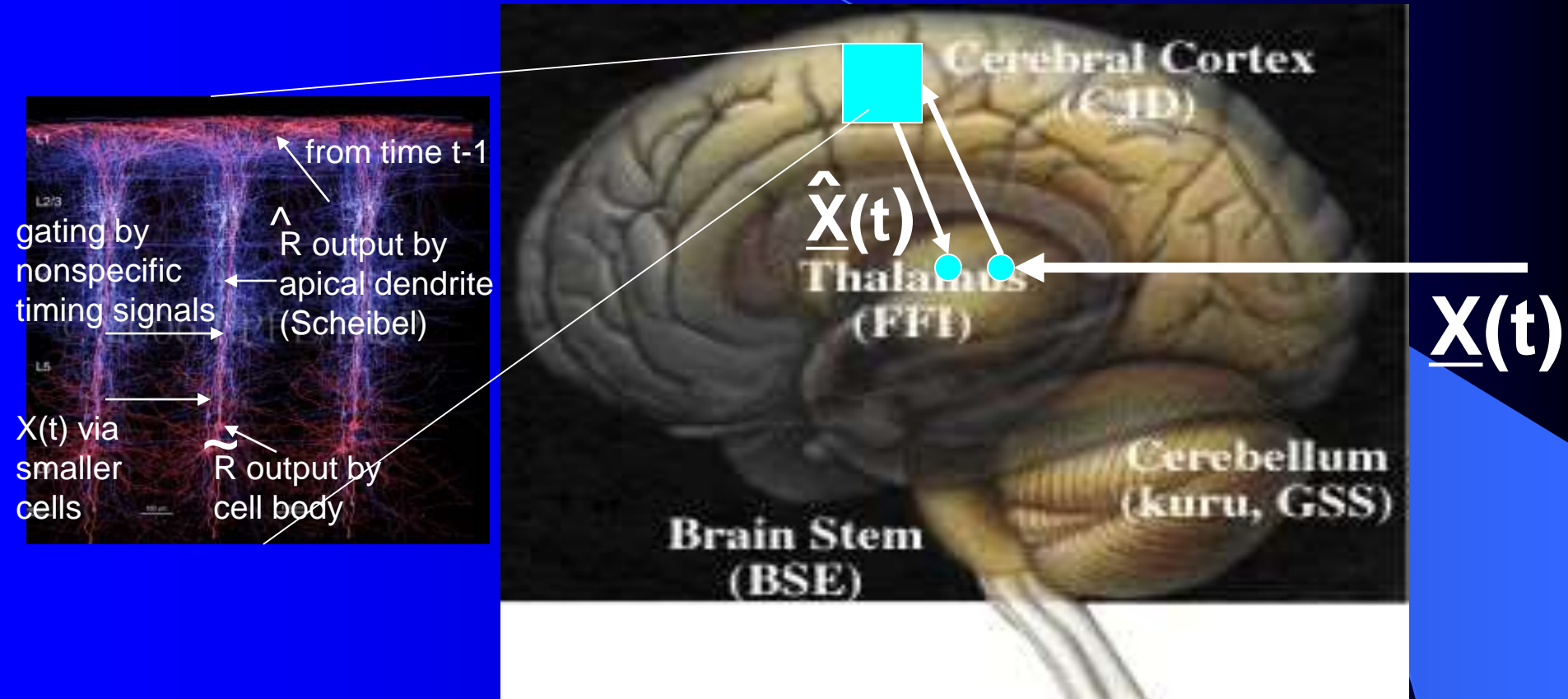


3. Mouse



Add
Creativity
System
(Cognitive map of
space of possible decisions)

Ability to learn to “Predict Anything” Found in the Brain (Nicolelis, Chapin)



Goldman-Rakic, Baars: Consciousness, working memory due to recurrent nets!!

Richmond: “ $t+1$ ” – t is .12 seconds. Each cycle has a forwards pass to predict, and a backwards pass to adapt, from multichannel unit data. NEW PAPER VERIFIES !

But Nicolelis statement also needs verification beyond rat whiskers, few words.

(Bliss, Spruston): found “reverse nMDA” synapse and backpropagation along dendrites

Regular Cycles of Forward and
Backward Signal Propagation in
Prefrontal Cortex and in
Consciousness:

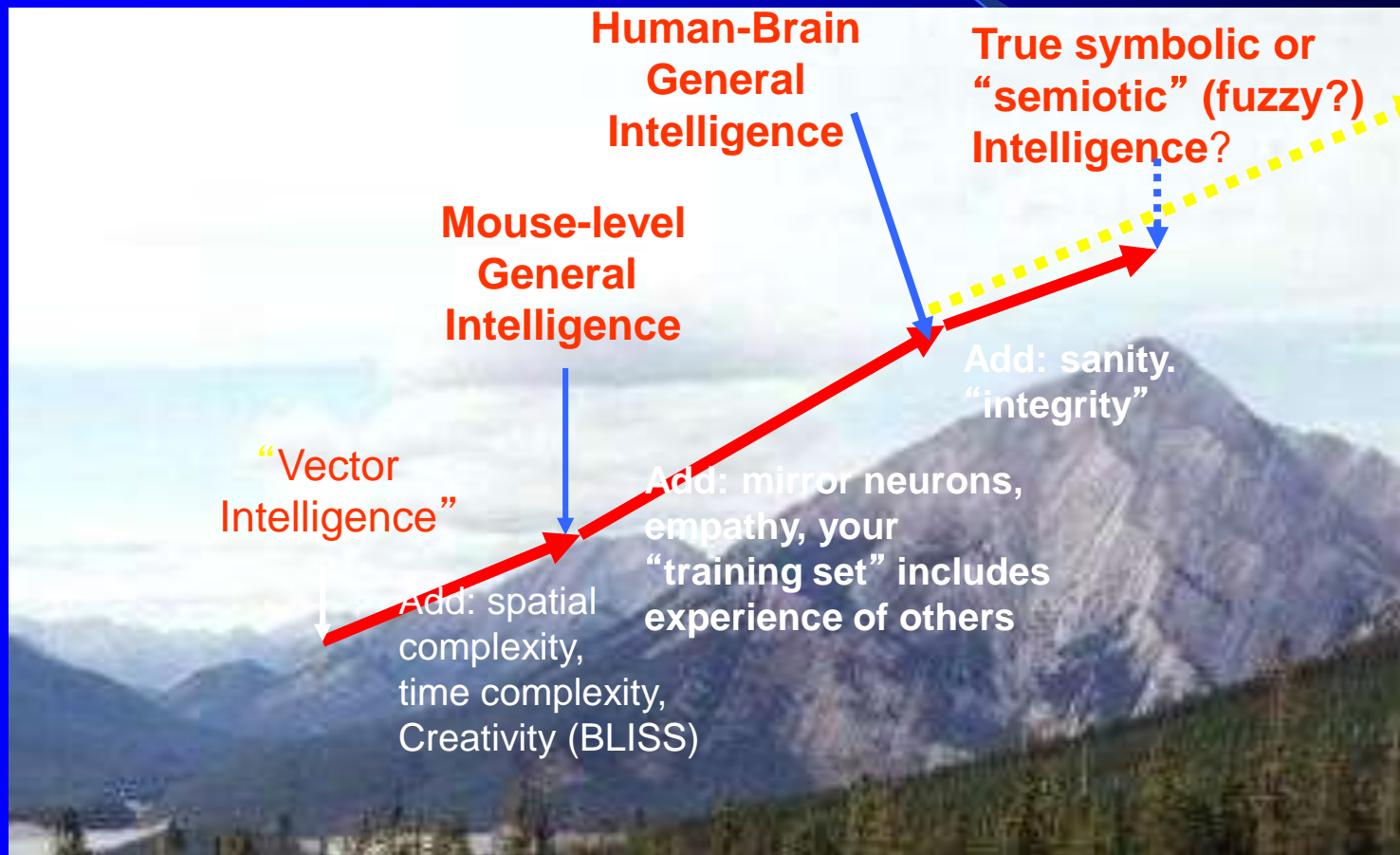
**Reviews & Demonstrates New Model
of How Brain Consciousness Works**

Paul Werbos and Joshua Davis

Frontiers in Systems Neuroscience November 28,
2016

Open access, link posted at
www.werbos.com/Mind.htm

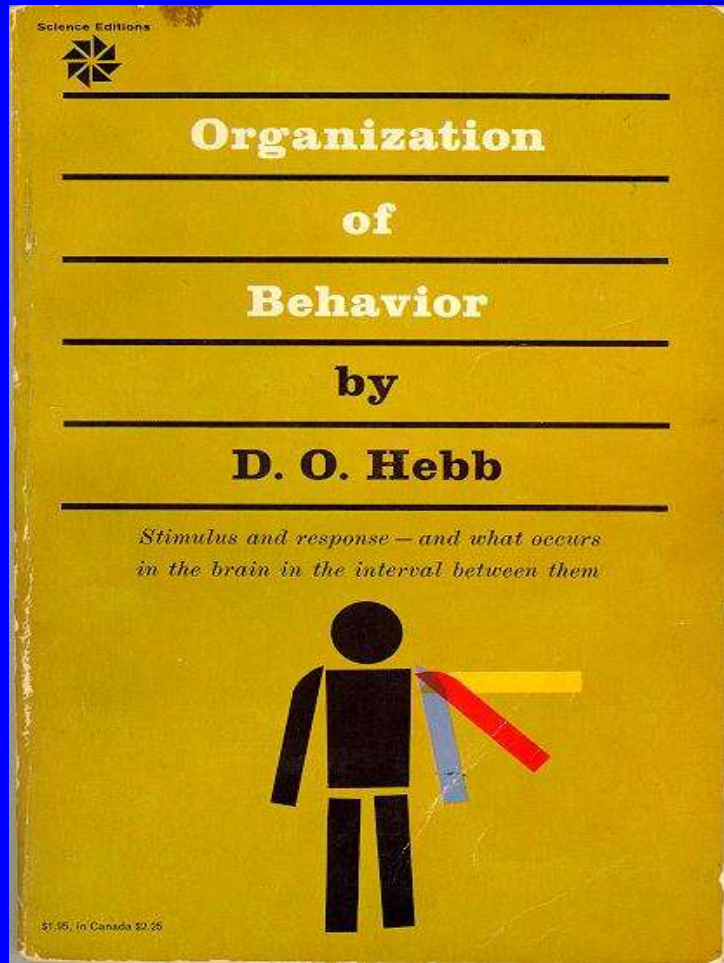
There are levels & levels of consciousness,
& we now know the mathematical principles
for understanding & replicating them.



Quantum & Collective Intelligence (Jung, Dao, Atman, noosphere)?

For details: www.werbos.com

Hebb 1949: Intelligence As An Emergent Phenomenon or Learning



$$\Pr(\text{Theory}|\text{Experience}) = \frac{\Pr(\text{Experience}|\text{Theory}) \cdot \Pr(\text{Theory})}{Z}$$

Theory: Spiritual or Paranormal experience is “real”

Hebb said Pr is small

Beyond the Mundane Brain

- Human history has many stories of life which do not fit the model of individual brain as the only intelligence. But they seem impossible in a simple model.
- Personal experience forced me to become open-minded in March 1967: I remembered and quoted a speech of Mao Tse Tung the day before it was given! (See Greeley 1969: 70% of PhDs have had personal experience they do not discuss.) BUY GOLEMAN, **CONSCIOUSNESS!!!**
- Two intense new directions:
 - Scour literature from “schools” all over the earth for ways to expand my first person database, because more and richer experience is needed to explain all this. Also use neural network model to guide this.
 - Re-examine basic physics and what is really possible, with the smallest possible change in physics from what we already know.

It's Not Just Me!

- Schrodinger, Heisenberg, De Broglie, Dyson
- Best survey data available (Greeley&McCready, in Goleman, *Consciousness*, Harper and Row 1979): **70% of elite PhDs say yes** to “Have you ever had the feeling of being very close to a spiritual force that seemed to lift you out of yourself?” But most respond with fear, conservatism, regression!!
- Soul is to most serious people today what sex was to Victorians!

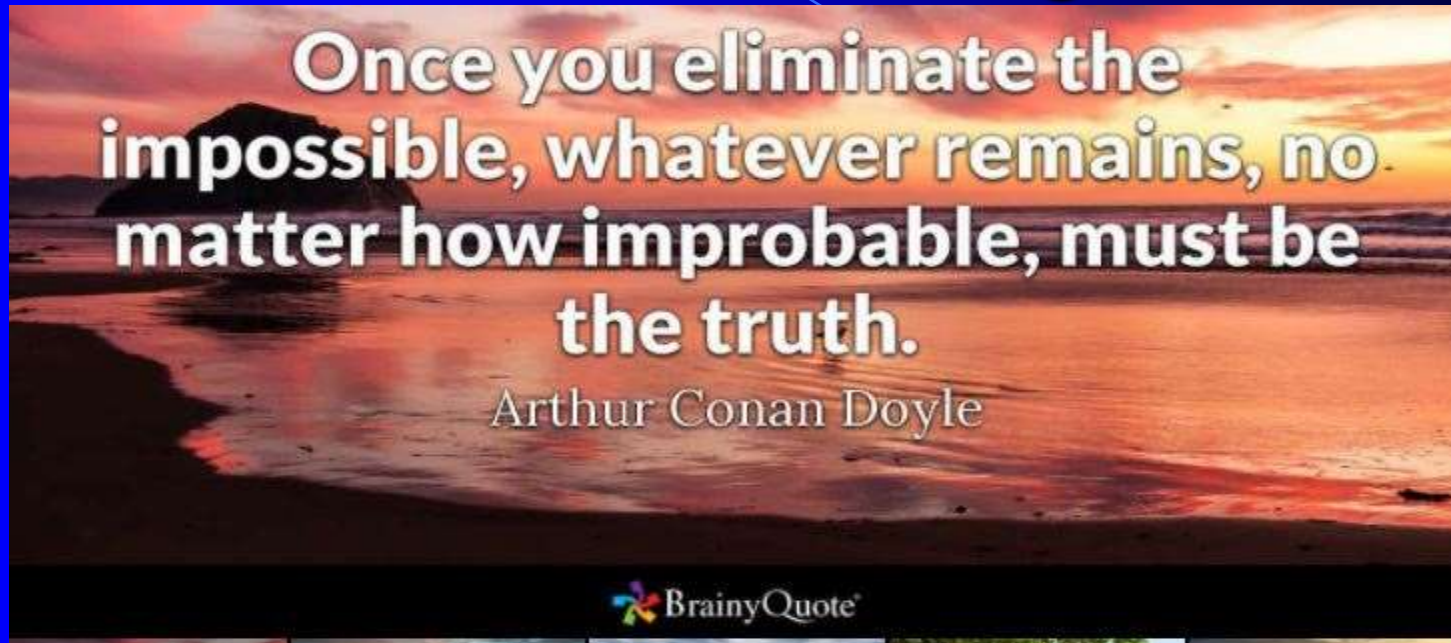
The Big Question Here.....

- *If* we believe paranormal effects and/or spiritual experiences are real
- *And if* we believe that everything is ruled by mathematical laws of nature (“physics”)
- *Then* what do we do about it? How can we improve our understanding?

QED REMOTE VIEWING

- Quantum effects are not enough
- Additional Force Fields?
- But if so, where is signal processing(SP) ?
- A radical chasm -- extreme choices; give up remote viewing totally or else:
 - “cables” & SP in the universe
 - esoteric biology or “soul,” symbiotic biology and intelligence
 - but either way, what about genetics?

The Noosphere Species Theory (www.Werbos.com/religions.htm)

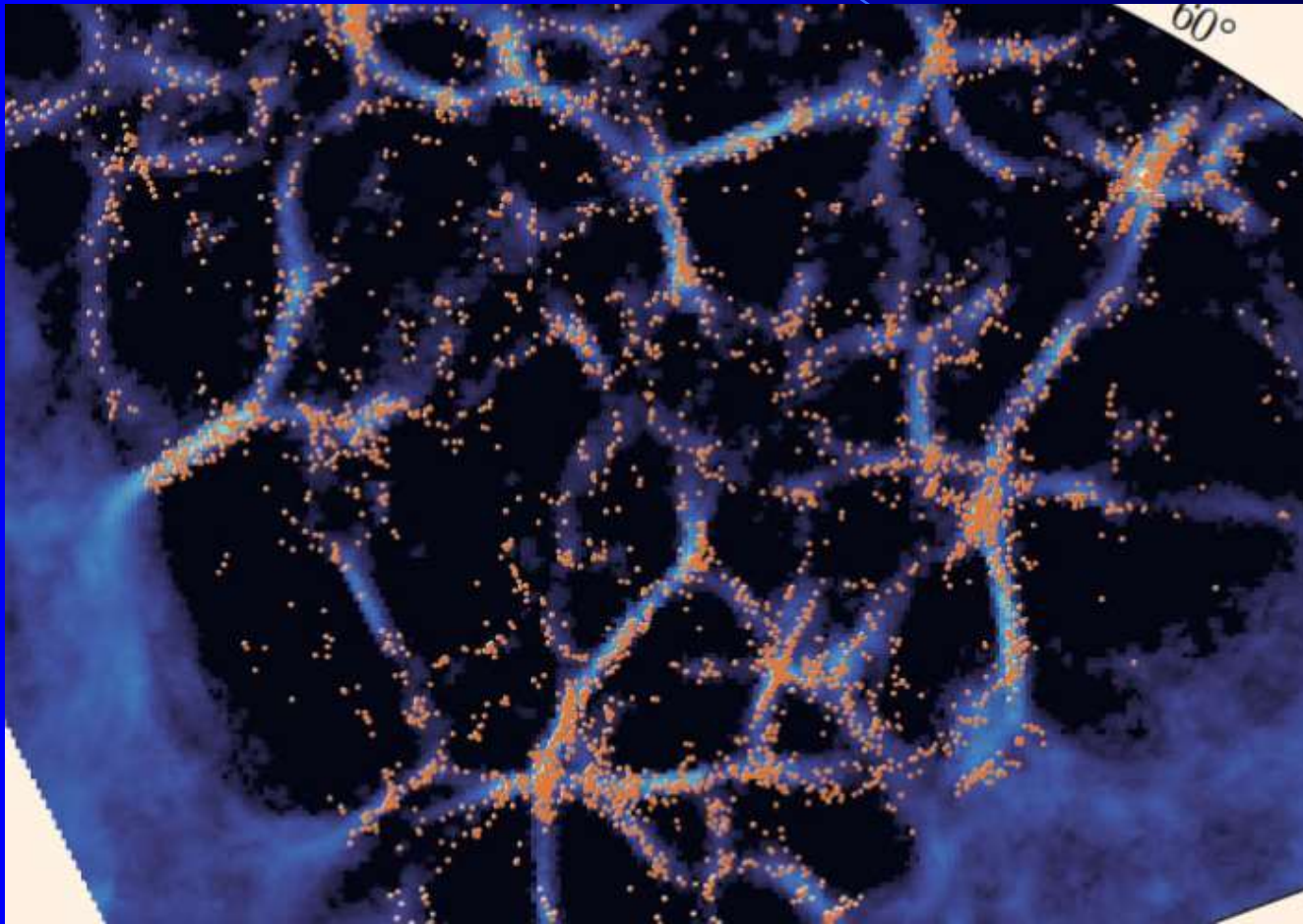


- Like noosphere theory deChardin/Verdansky but:
 - Origin in evolution of noospheres in cosmos is necessary for logical completeness as a scientific theory
 - Fits how our solar/earth noosphere “is a baby” (Terry not Gaia)

The Biggest Picture

- Is the dark cosmos a dark forest or an ocean of life?
- Is the primitive village earth surrounded only by hungry tigers or by an ancient civilization like China 1500AD?
- Who of us will respect our true ancestors and pass the serious examinations?

Where we come from: a whole ecology of noospheres



Visualize our local noosphere as a great tree, in which we are all connected



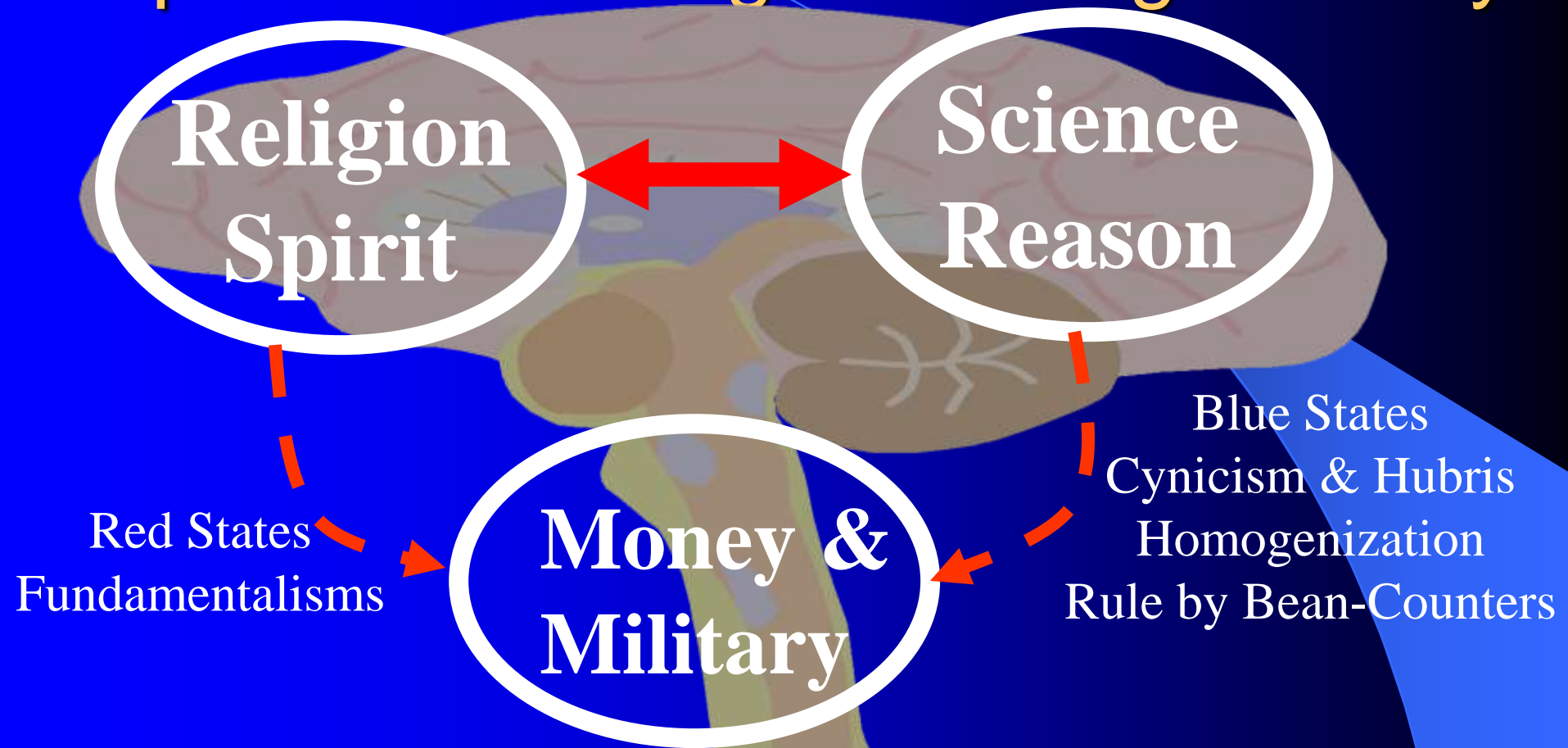
A living organism, from the deep mud to the sun, able to see more. Or a little fish in a big aquarium (the Deep)?

Beyond the Individual Human Brain – A Few Quick Thoughts Based on What I Have Seen

- Quantum level – search on Werbos at <http://arxiv.org>
- Multimodular – just more symmetry, extends spatial complexity for a kind of collective intelligence
- $\partial J / \partial R_i$, a backpropagation signal, represents “how much an increase in R_i makes to happier. It represents the value of R_i to you. It fits Freud’s idea of “psychic energy.” Backpropagation of J derivatives represents a kind of flow of emotional energy in the brain. It drives the learning of all that we do.
- Collective intelligence requires similar flows of derivative information between people and connecting to the larger world. Is “ki” or “tao” (or “tama”) really just a flow of the same kind of derivative signals in our larger Mind, driving the larger course of our culture and society and world? Is it governed by the same mathematics, the chain rule for ordered derivatives?

The Force be With You!!!

Religion – Science: Still the most important challenge to dialogue today



The task: remember Greeley's data, and Build on Teilhard de Chardin

Building (or Understanding) Quantum Mind: START from “Multiverse” physics: the most plausible mainstream theory of everything



QTM:
Quantum
Turing
Machine

$$\dot{\psi} = iH\psi(X, t)$$

$$\psi = \psi_0 \oplus \psi_1 \oplus \dots = \psi(FS)$$

$$\psi_1(x_1, s_1), \psi_2(x_1, x_2, s_1, s_2)$$

- We live in Fock Space (FS), an infinite dimensional space with multiple copies of all of us.
- MACROSCOPIC Schrodinger Cats are now proven, but there is an Einsteinian alternative using multiple threads instead of multiple universes (WCCI2022)