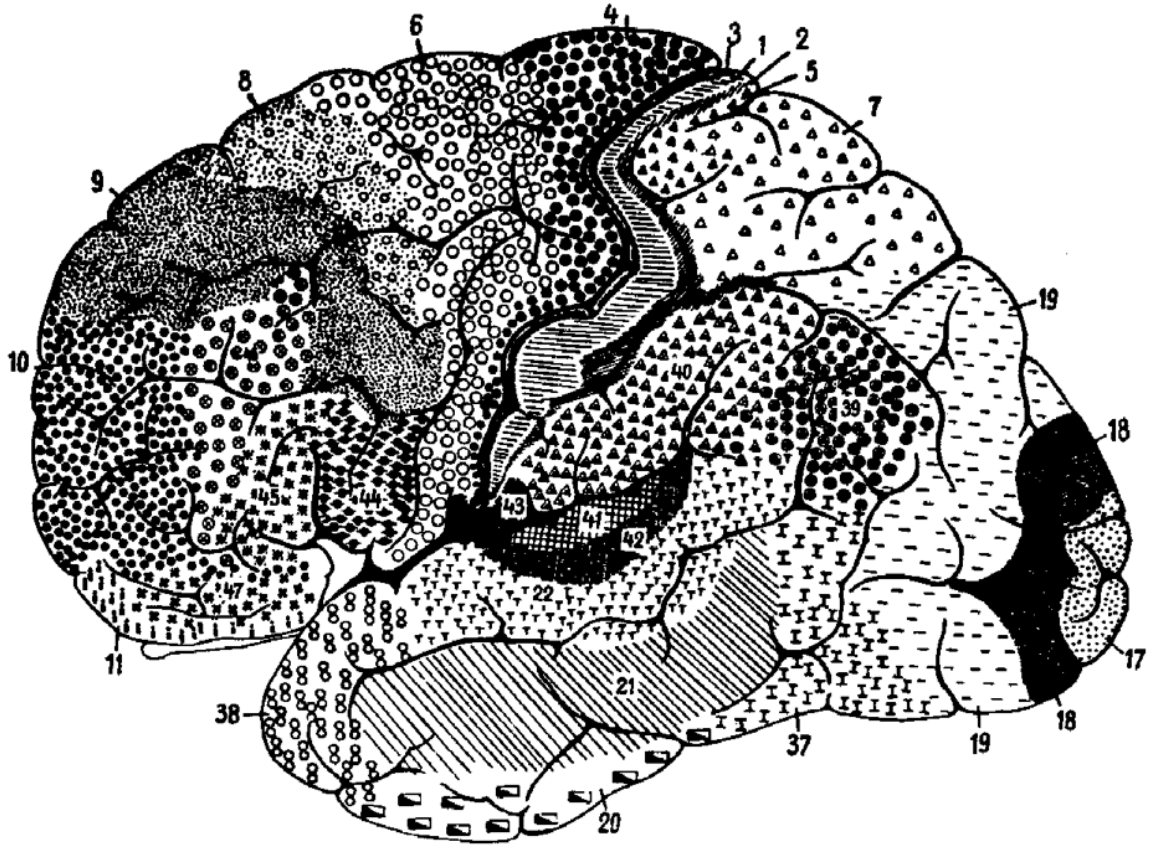
VDW, Berlin
5. und 6. Oktober, 2020

Theodosius Dobzhansky
(1900-1975)

"Nothing in biology
makes sense except
in the light of evolution."

Let me add:
"and cognitive science"



Korbinian Brodmann

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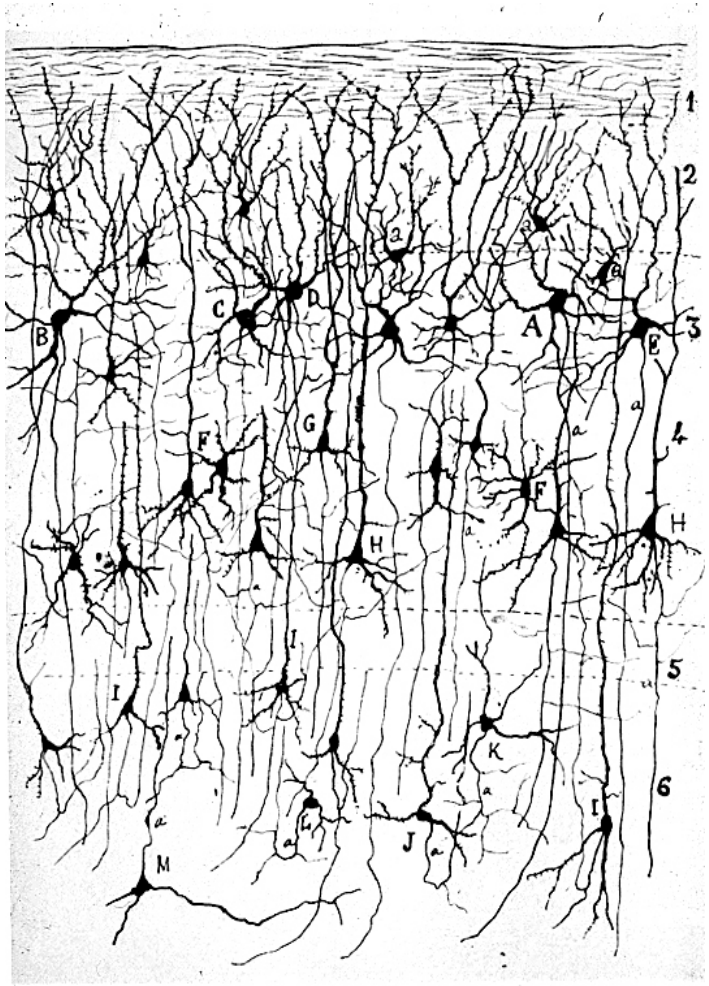

GOLGI-STAINED NERVE TISSUE from the visual cortex of a rat was sketched by Cajal in 1888. The numbers along the right-hand margin identify cellular layers; the capital letters label individual neurons. One of Cajal's most important contributions to neurobiology was to establish the neuron as a discrete, well-defined cell rather than as part of a continuous network.

Perhaps the most challenging question in Cognitive Science is the "identity question".

How is unity in the mind possible, if the brain consists of more than 100 billion discrete elements (neurons) as **Ramón y Cajal** has shown?

How becomes
an object an object,
a face a face
a thought a thought,
a feeling a feeling,
a memory a memory,
a melody a melody
being always

ONE.

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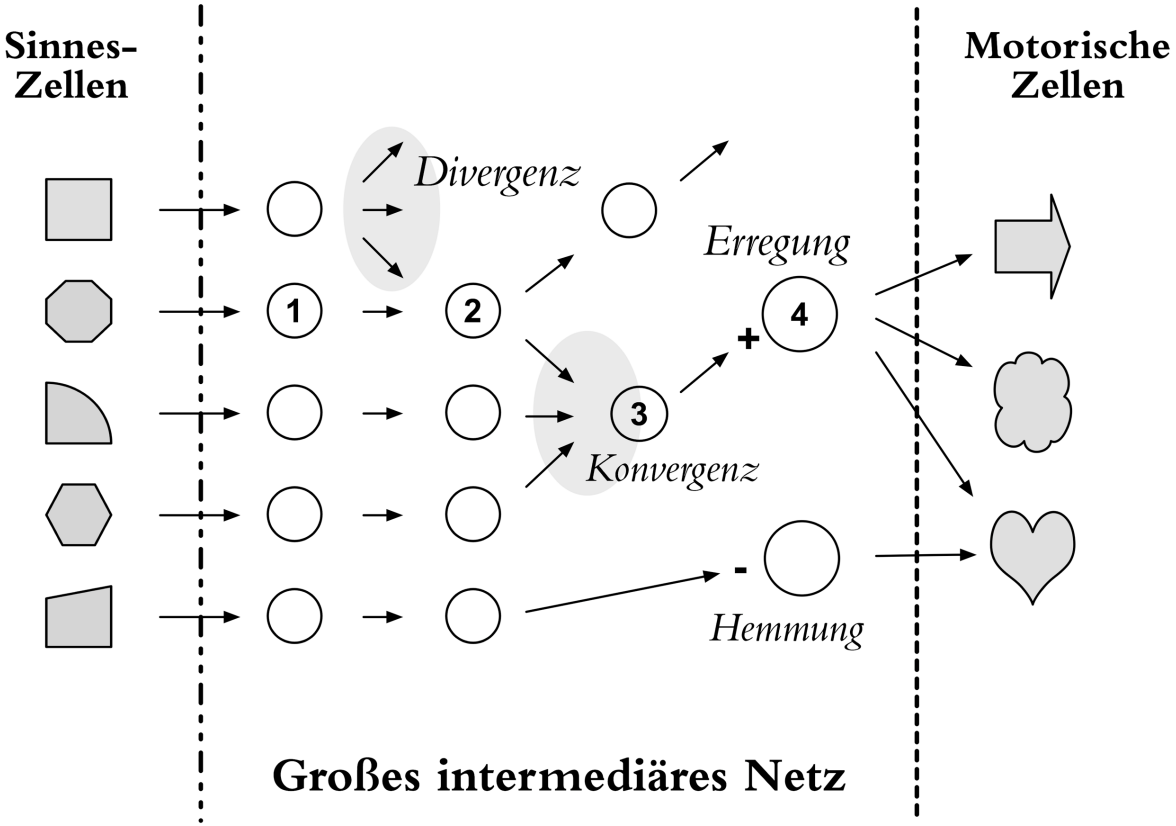
principle structure and function of brains



Nauta‘s Law:

The maximal distance of neurons is four intermediate neurons or synaptic contacts.
Consequence:
extremely dense connectivity

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Distinction between content functions,
the “material” of cognitive functions
(percepts, memories, emotions, volitions, thoughts),
the **WHAT**

and logistical functions,
the necessary operations for the availability of functions
(activation, attention, temporal organization),
the **HOW**

Methodological principle:
The loss of a function fundamental disruption is a proof of its existence.

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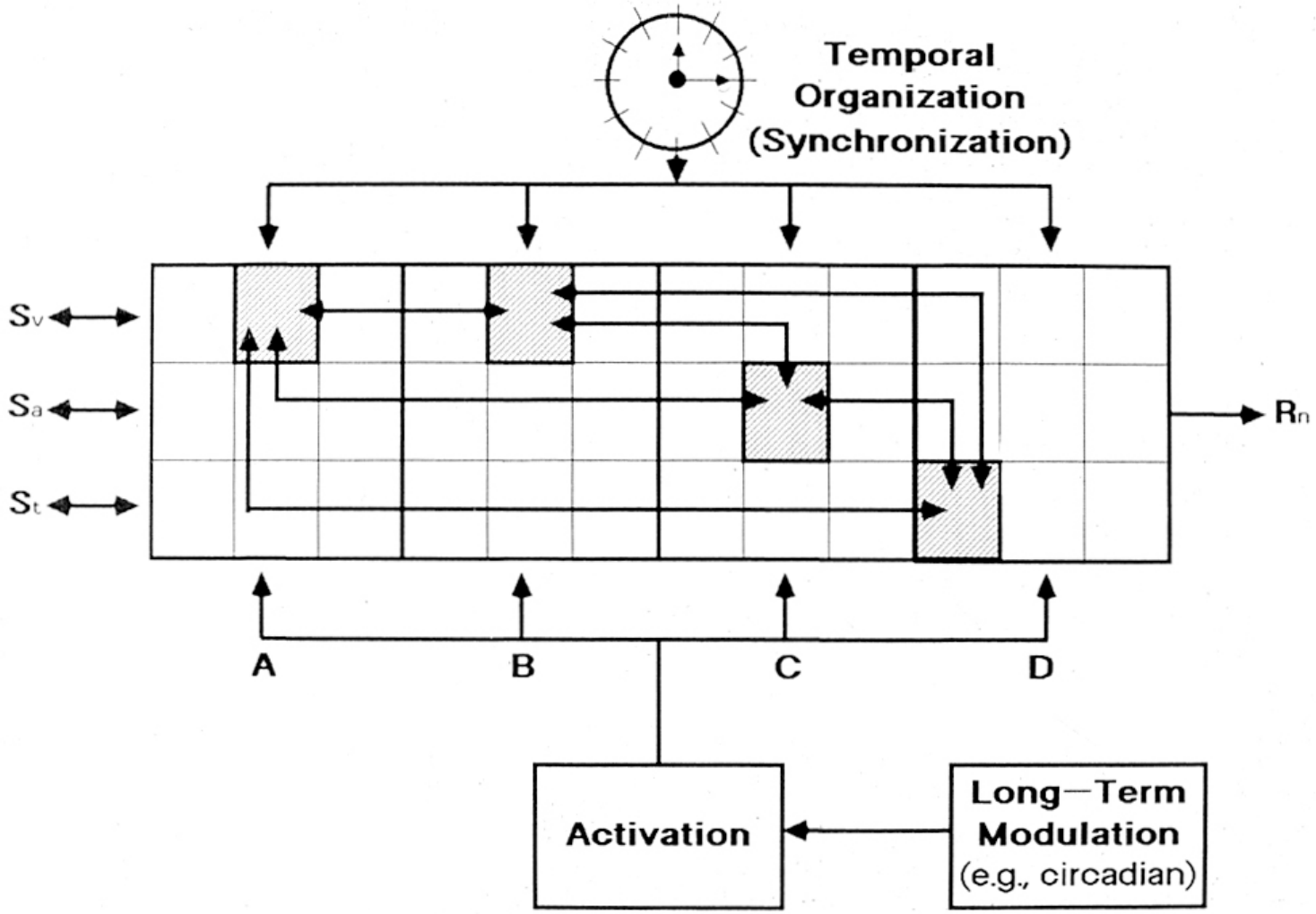

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Mathematische Spielerei:

Wie viel mögliche Funktionszustände hat eine Nervenzelle?

Notwendigkeit der Unberechenbarkeit
Notwendigkeit der Komplexitäts-Reduktion
Notwendigkeit von Vor-Urteilen
(Ökonomie-Gesetz des Handels , ein evolutionäres Erbe)

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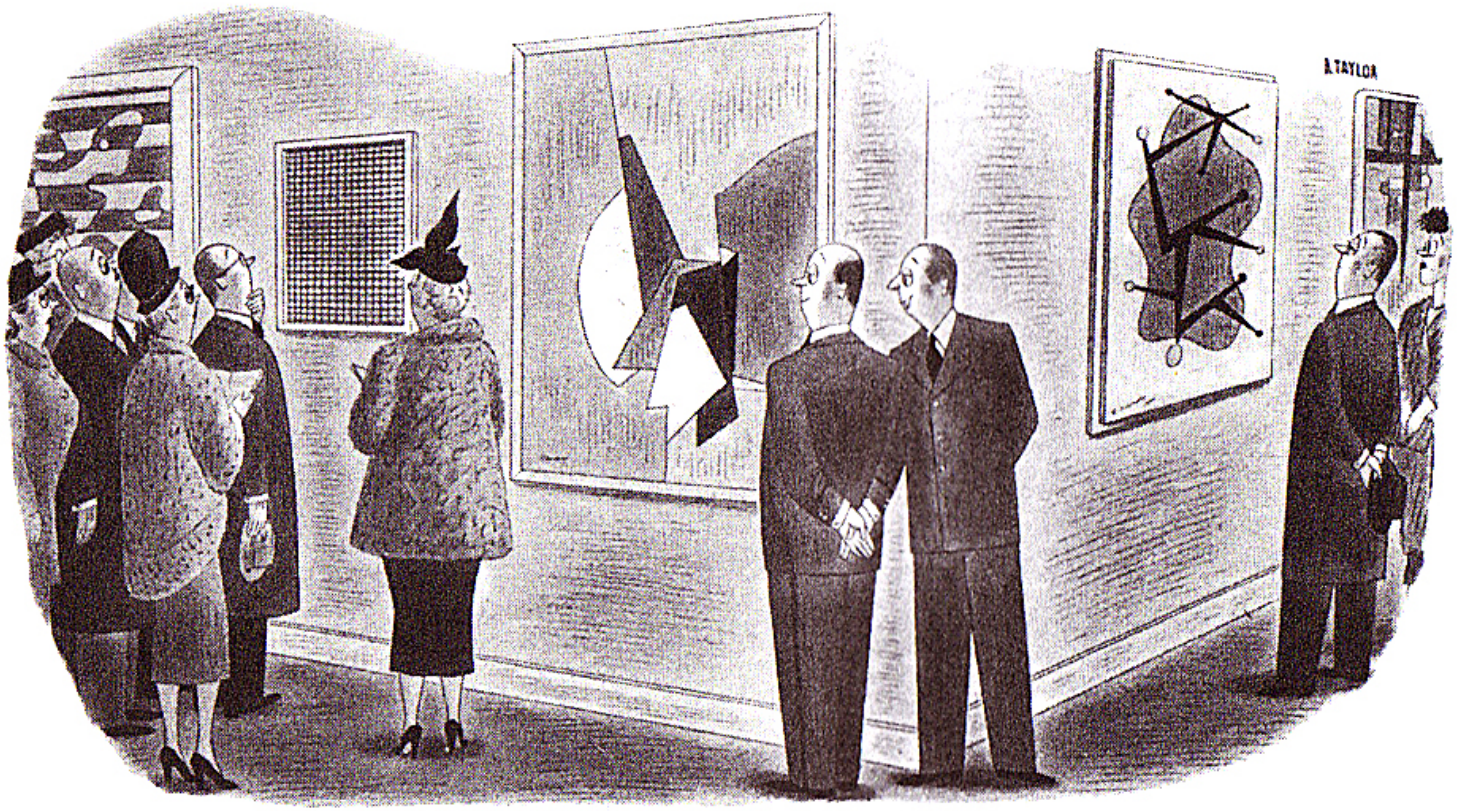

"I'm not going to be the one to tell 'em it's a ventilator."

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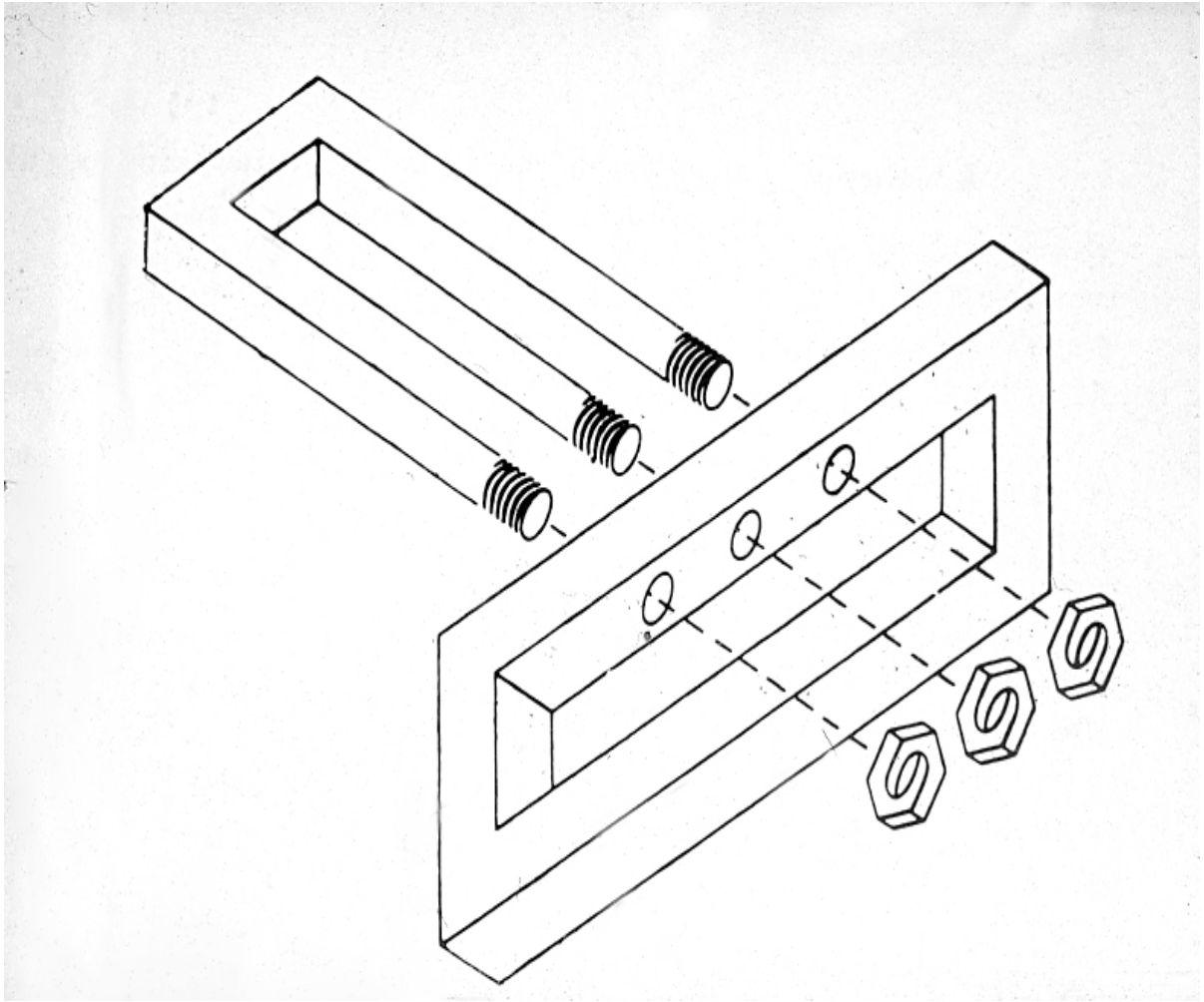

Das Unmögliche kann nicht akzeptiert werden.

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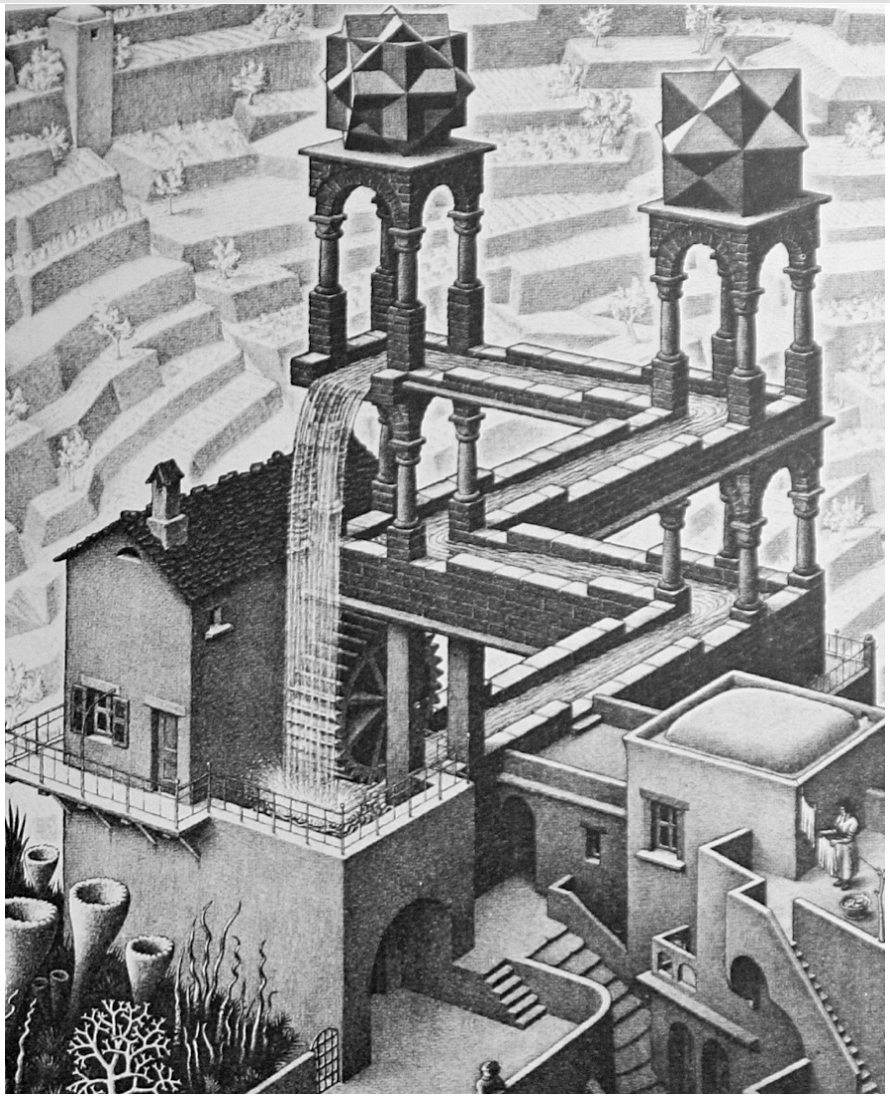

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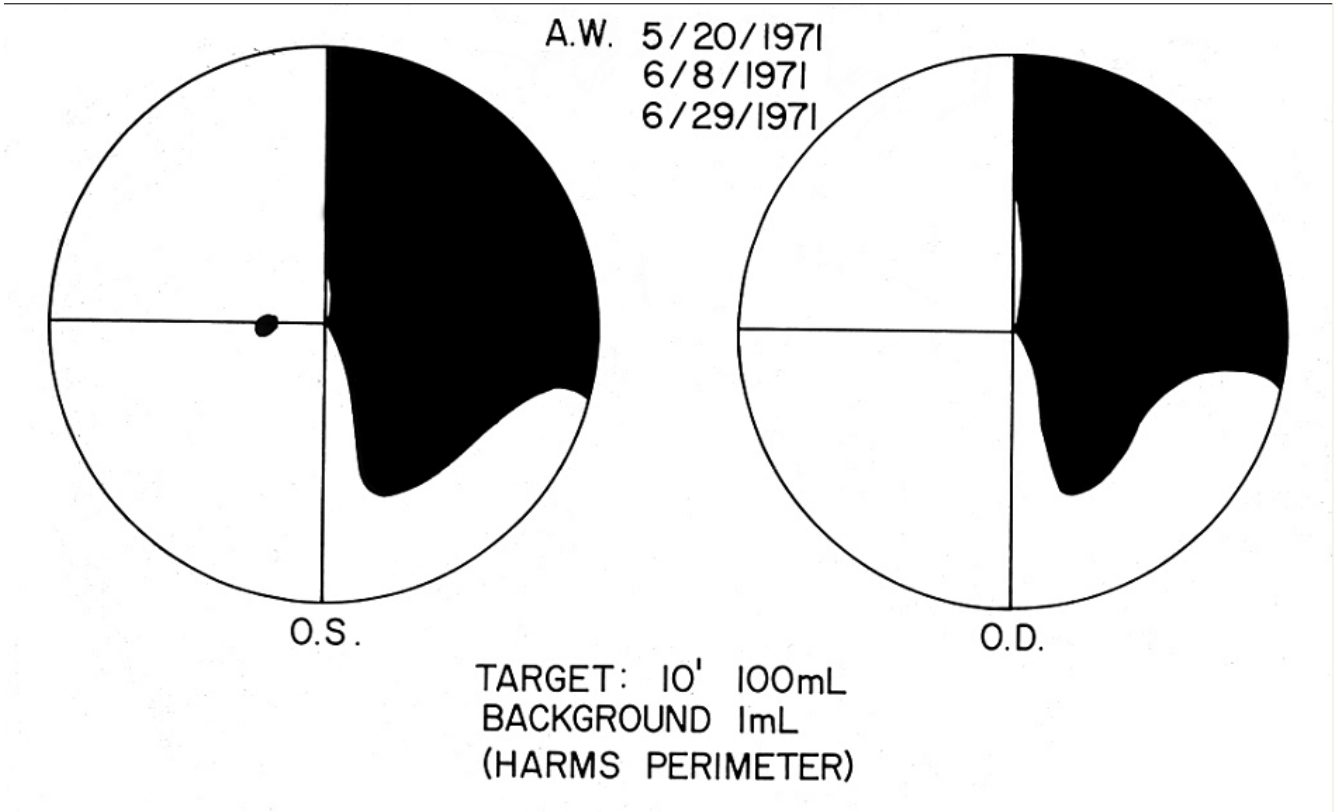
Experimentelles und konzeptionelles Paradigma:

Der Verlust einer Funktion
ist der Beweis seiner Existenz.

Daraus folgt bezüglich des „Leib-Seele-Problems“
ein pragmatischer Monismus.


A.W. 5/20/1971
6/8/1971
6/29/1971
O.S.
O.D.
TARGET: 10' 100mL
BACKGROUND 1mL
(HARMS PERIMETER)

Formen des Wissens

explizites, sprachliches, Komplexitäts-reduzierendes Wissen
(Sokrates: Ich weiss, dass ich nicht weiss.)

implizites, motorisches, rituelles Wissen (tacit knowledge)
(Ich weiss nicht, dass ich weiss. Ich kann.)

bildliches Wissen:
sensorisch, topologisch, episodisch
(Ich sehe, ich verstehe, ich bin.)

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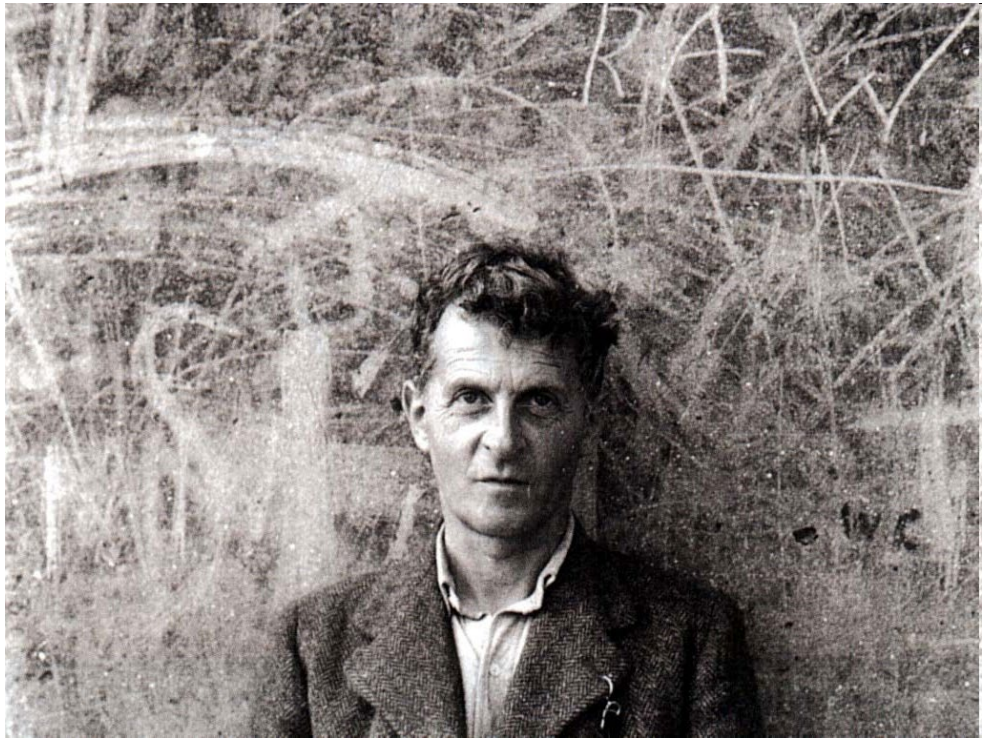

Ludwig Wittgenstein:

„Die Grenzen meiner Sprache bedeuten die Grenzen meiner Welt“

(5.6 T.L-P.)

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REMBRANDT, *Selbstbildnisse*

a) 1629 Mauritshuis, Den Haag
b) 1633 Musée du Louvre, Paris
c) 1634 Wallace Collection, London
d) 1635 Kunsthistorisches Museum, Wien
e) 1637 Mauritshuis, Den Haag
f) 1639 Radierung, erster Zustand
g) 1640 Wallace Collection, London
h) 1640 The National Gallery, London
i) 1648 Radierung, zweiter Zustand
j) 1652 Kunsthistorisches Museum, Wien
k) 1657 Kaiserl.-königliche Galerie, Wien
l) 1660 Musée du Louvre, Paris
m) 1664 Galleria degli Uffizi, Florenz
n) 1665 Wallraf-Richartz-Museum, Köln
o) 1669 The National Gallery, London
p) 1669 Mauritshuis, Den Haag

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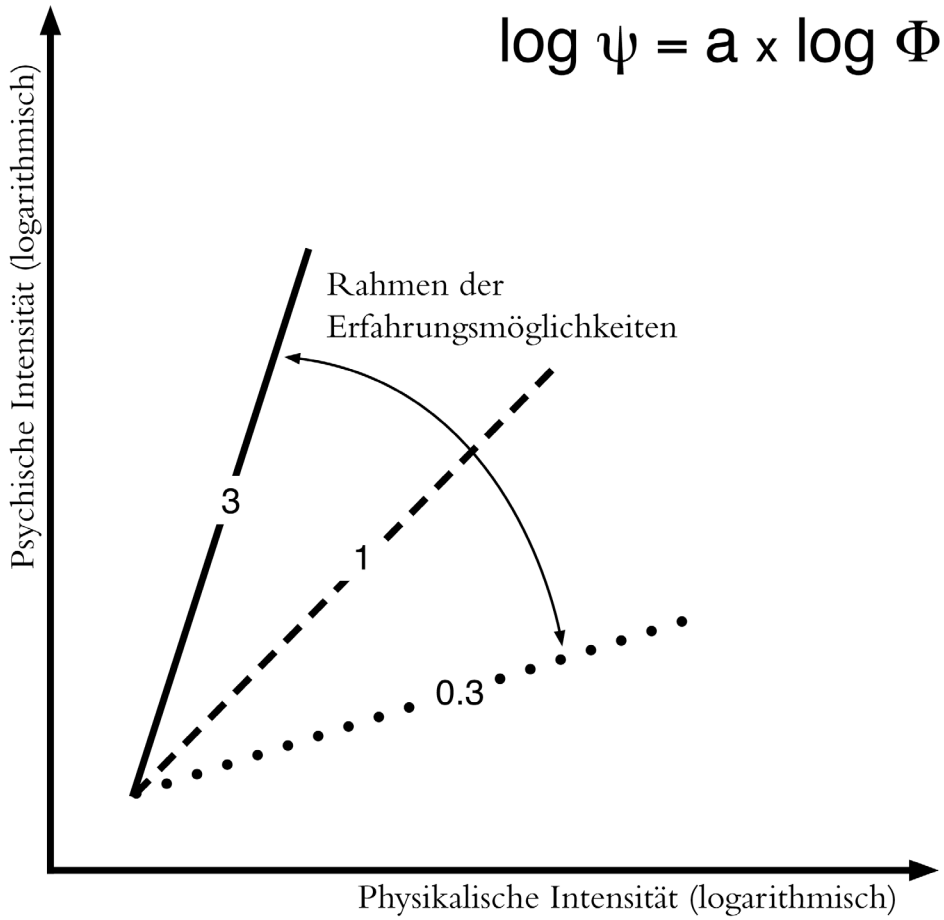
$$\log \psi = a \times \log \Phi$$



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Episodisches Wissen

Grundlage der Ich-Identität

Notwendigkeit, sein eigener *Doppelgänger* zu sein

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Some unsolved, some unasked questions in cognitive science, and some unused applications

Taxonomy of functions: Why not a problem?

Time in perception and cognition: continuous or discrete?

Visual space: homogeneous or inhomogeneous?

Relationship between explicit and implicit knowledge

Explorations with single cases, confirming with group statistics

Bidirectional dependencies between thought and language

Linking anthropological universals and cultural specifics

Relationship between levels: from cells to modules to experience

Technicalities: meaning of a BOLD signal in fMRI (hidden phrenology)

Integration of imaging technologies: fMRI, MEG, EEG, PET, DTI

Mathematical dis-similarities of different neurocognitive states

Occam‘s razor misunderstood: monocausalitis vs complementarity

How to „harvest“ cognitive science in
Medicine, Technology, Education, Politics, Arts?

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