

# **An Wänden anwenden: *Pictures and some scientific stories behind***

Ernst Pöppel  
Ludwig Maximilian University  
Munich, Germany

## **A Collage**



Learning from the East:

Konfuzius said:  
when you are  
70 years old,  
you can do  
what you want.  
What about 80+ years?



## In the office

Nejra Rizvanovic, Bosnia, Morocco

Yang Taoxi, China, UK

Mu Nan, China

Garam Jeong, Korea, Germany

Arusu Formuli, Afghanistan, Germany

Koji Tanida, Japan



In the office

Wang Tianhe

Zeng Yifan

Zhang Zhilin

Yang Haiming

Yu Xinch

Winter School students  
from Peking University

## Illusions, Questions

Search for order  
Identity question  
Surfaces in space  
Continuity in time  
Speed of recognition  
Construction of images  
Illusion of understanding



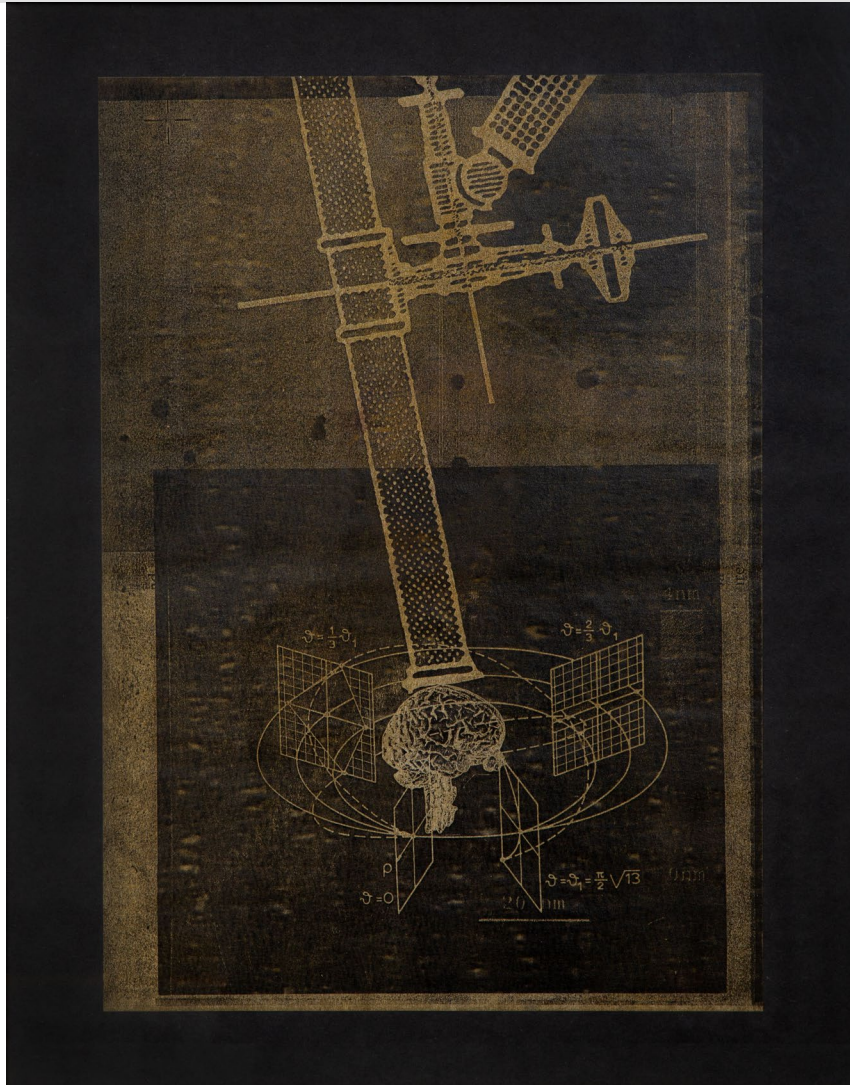
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Search for order

No taxonomy, No science



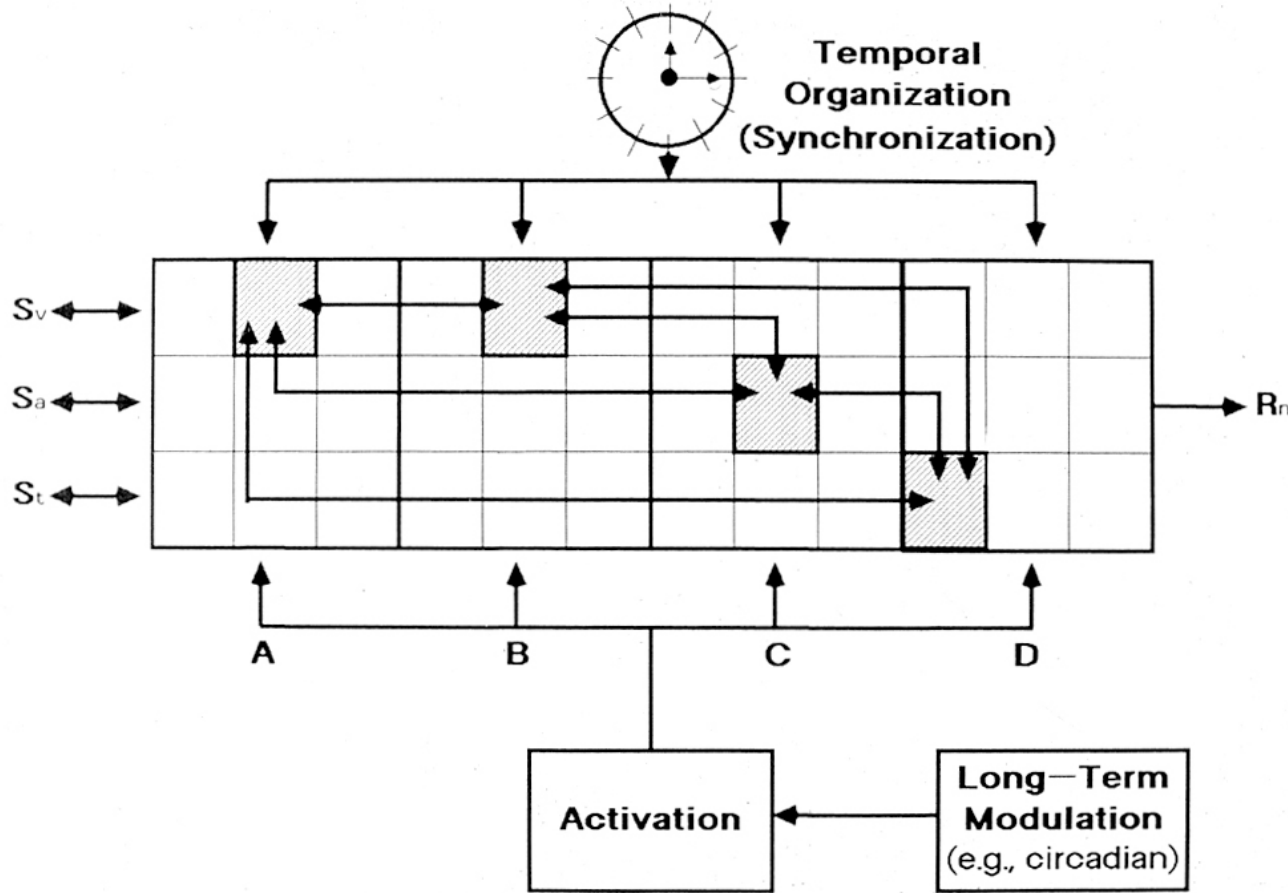
Picture from  
the artist  
Igor Sacharow-Ross,  
based on an  
installation in a  
museum in Munich







Picture by the  
German artist Perzan,  
motivated by the  
YiJing



Conceptual  
model of  
**content** and  
**logistical**  
functions



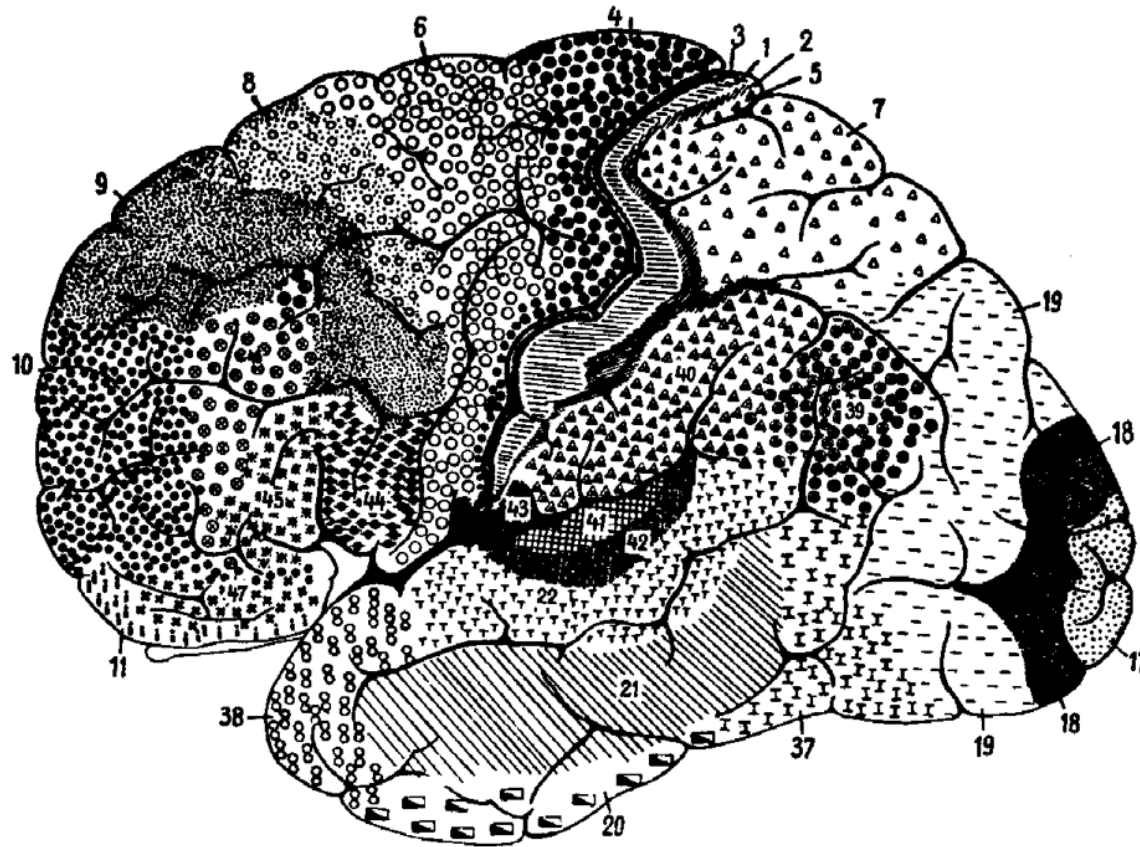
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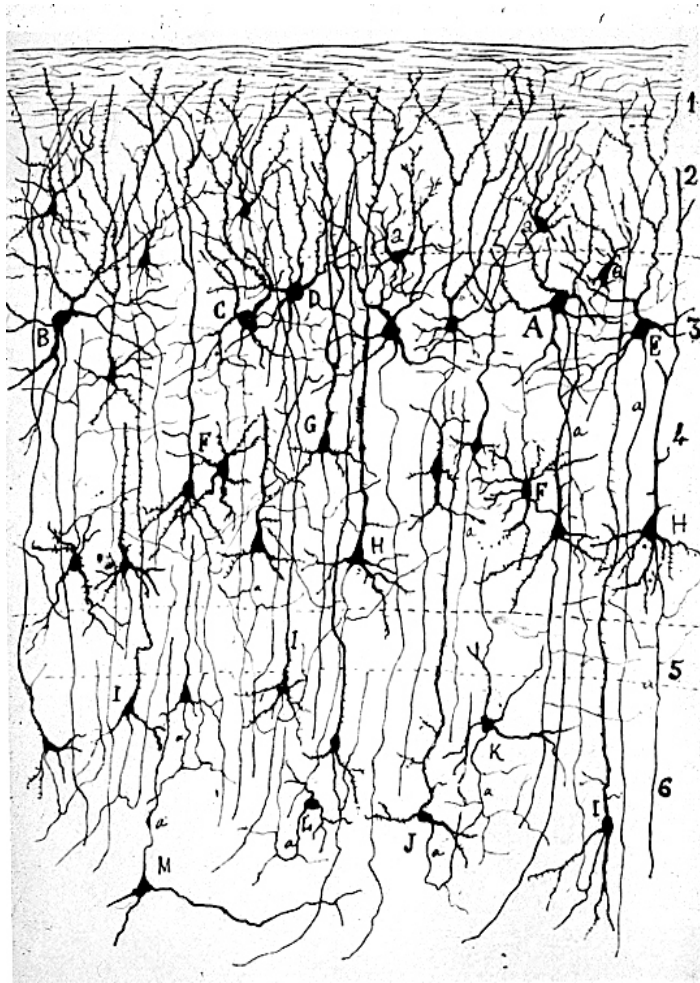


# Identity Question

Self  
Percepts



Korbinian Brodmann



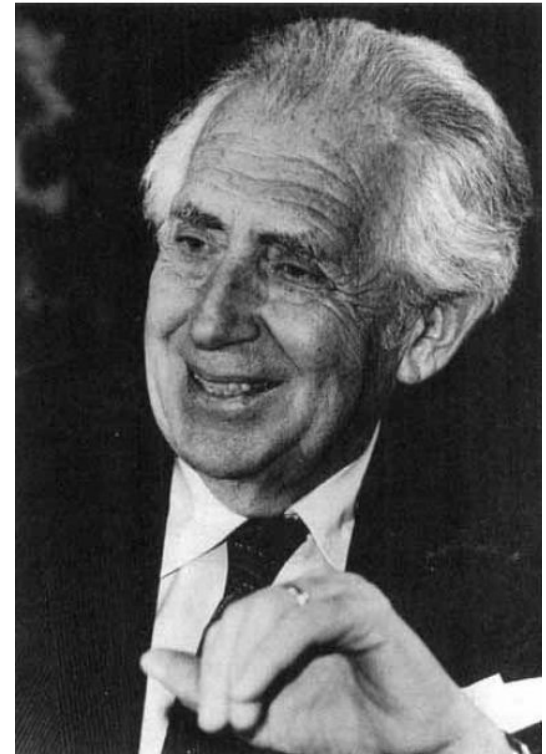
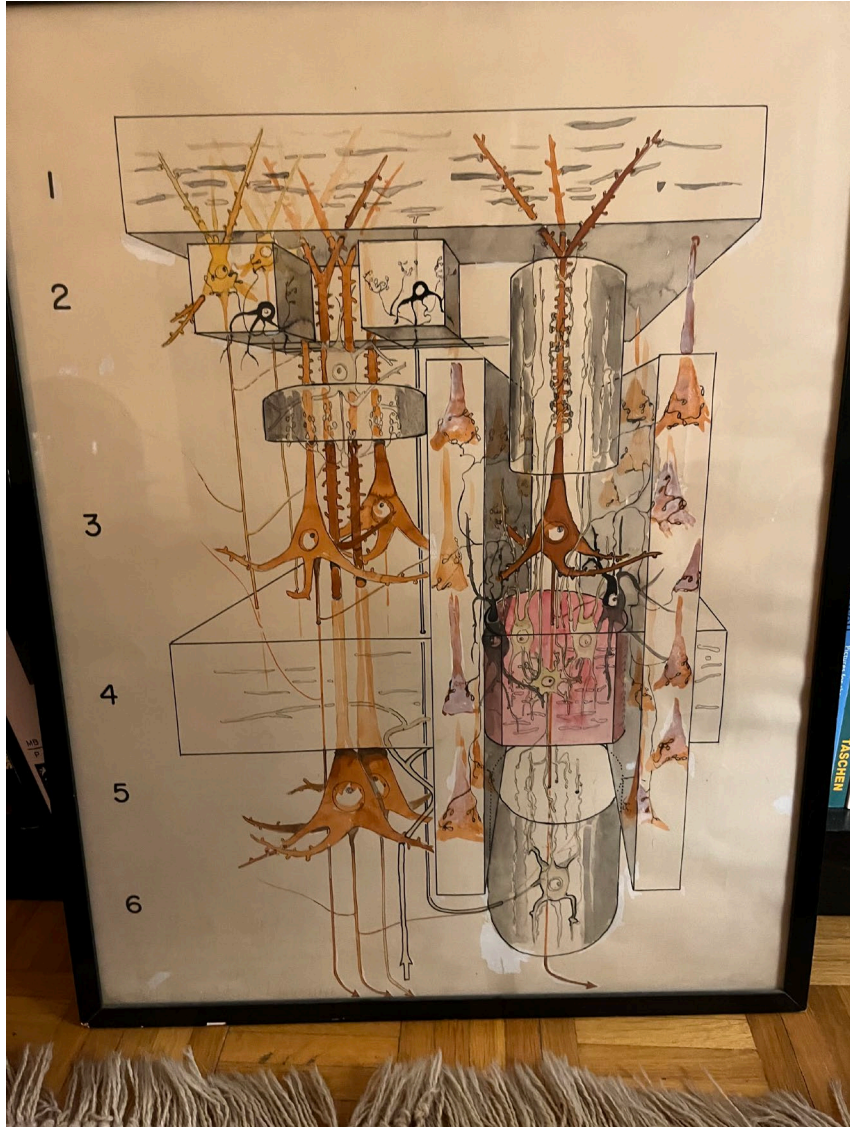
GOLGI-STAINED NERVE TISSUE from the visual cortex of a rat was sketched by Cajal in 1888. The numbers along the right-hand margin identify cellular layers; the capital letters label individual neurons. One of Cajal's most important contributions to neurobiology was to establish the neuron as a discrete,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

Perhaps the most challenging question in Cognitive Science is the “identity question”.

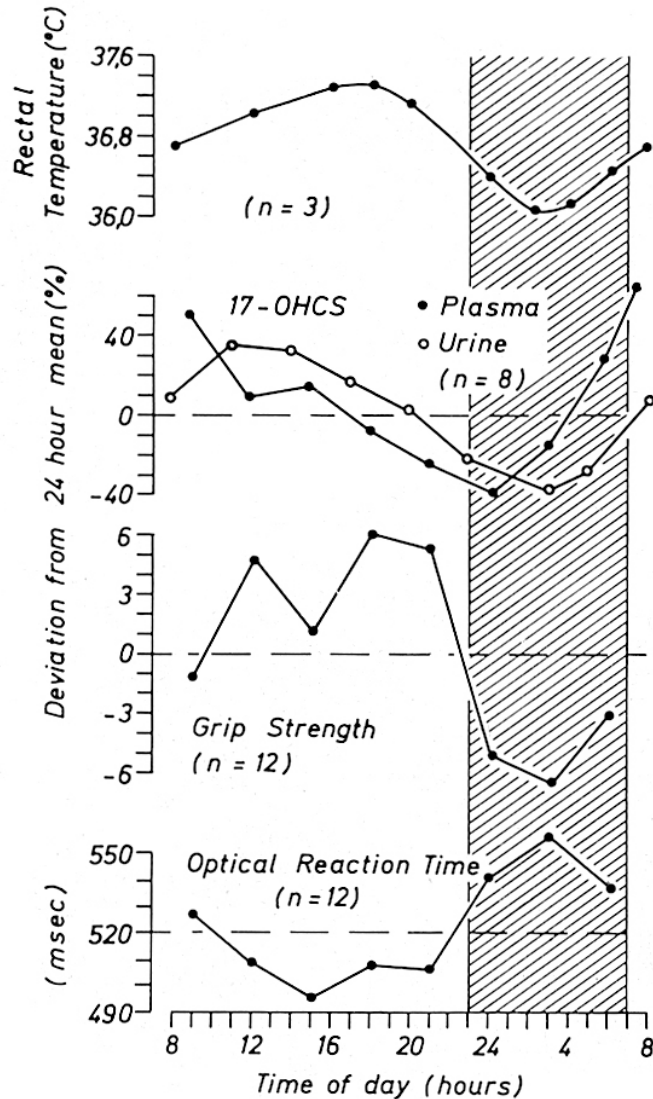
How is unity in the mind possible, if the brain consists of more than 100 billion discrete elements (neurons) as **Ramón y Cajal** has shown?

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.



Janos Szentagothai



## The question of identity

The phase map changes continuously throughout the day. The same constellation of psychological and physiological functions is seen only every 24 hours.

The question arises why we experience personal identity, our “self”, throughout a day, although we are changing all the TIME?



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# Surfaces in Space

## From Discreteness to Flatness

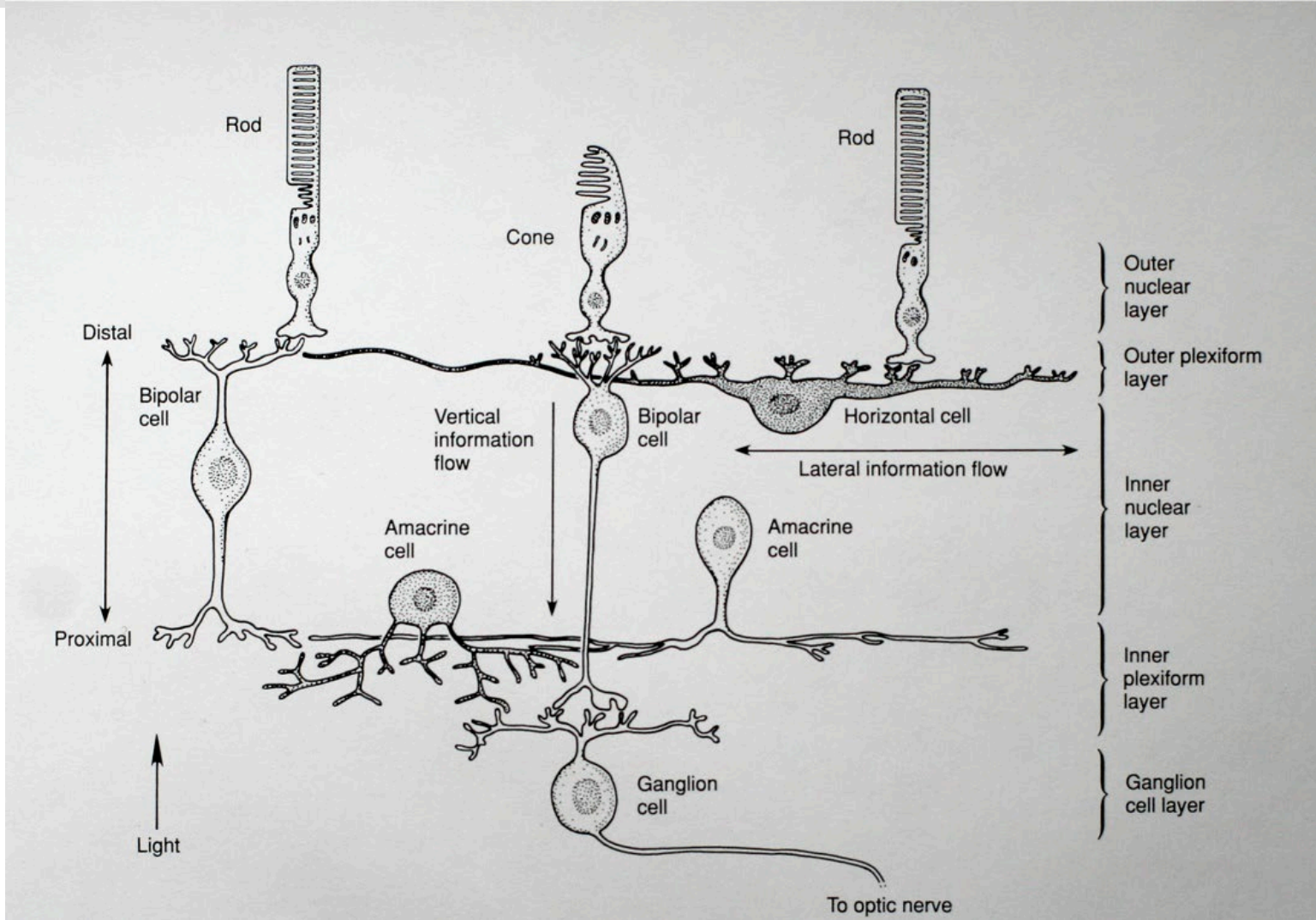


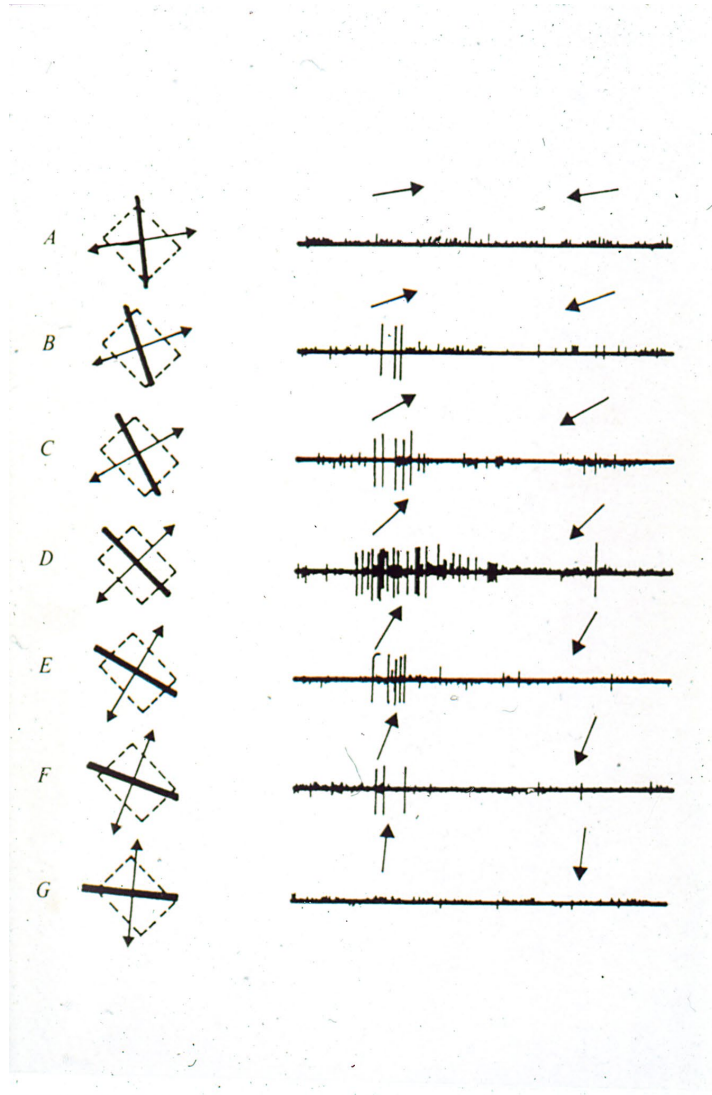
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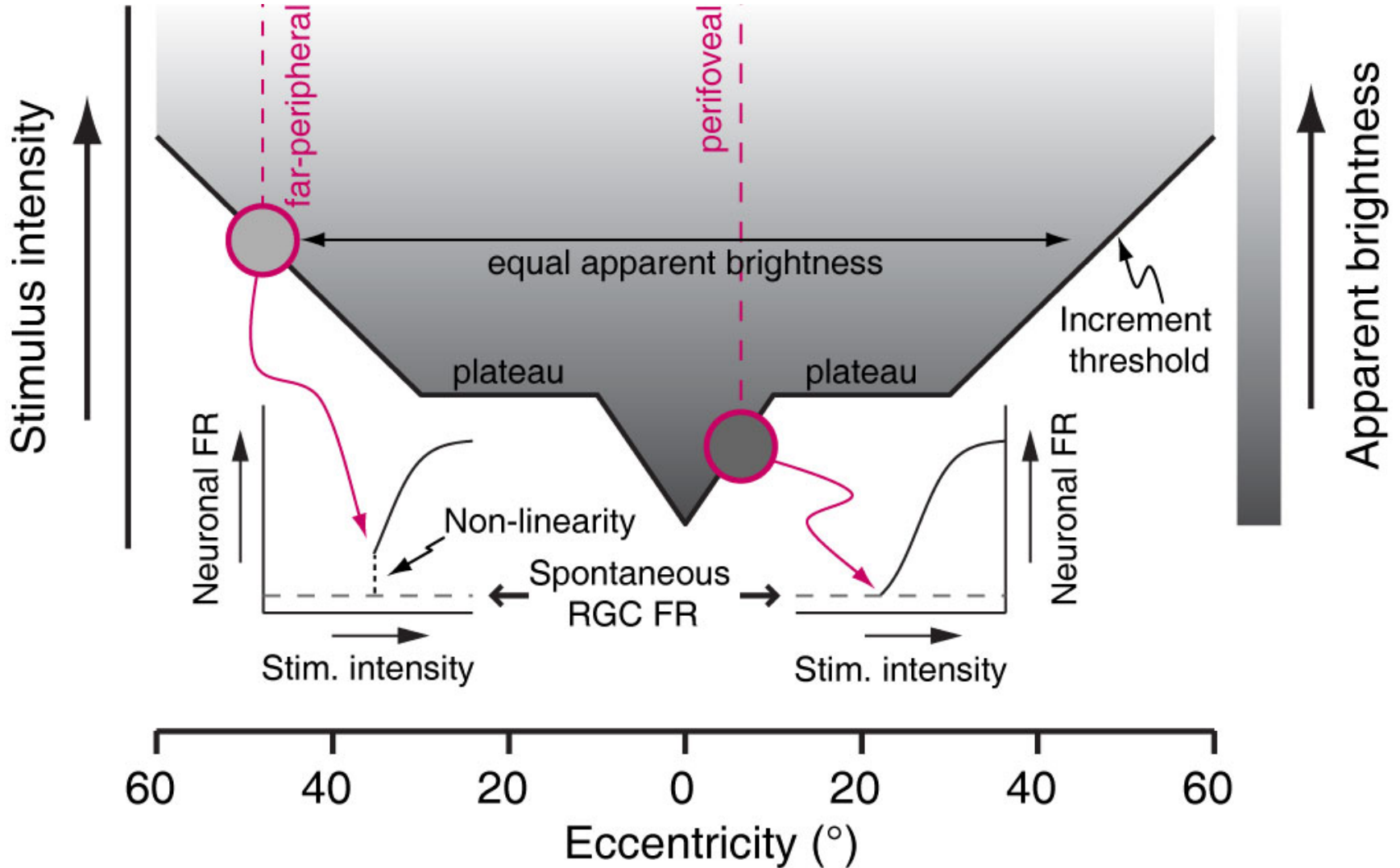






The phrase was (genau gesagt)  
(By & large) { Psychophysics is right, but boring  
Neurophysiology is interesting, but wrong.

Statement  
by David Hubel,  
Nobel Laureate





Silk screen by the  
American artist  
Anne Ballou

Are flat surfaces  
necessary to see  
something as  
something?



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Continuity in, of time

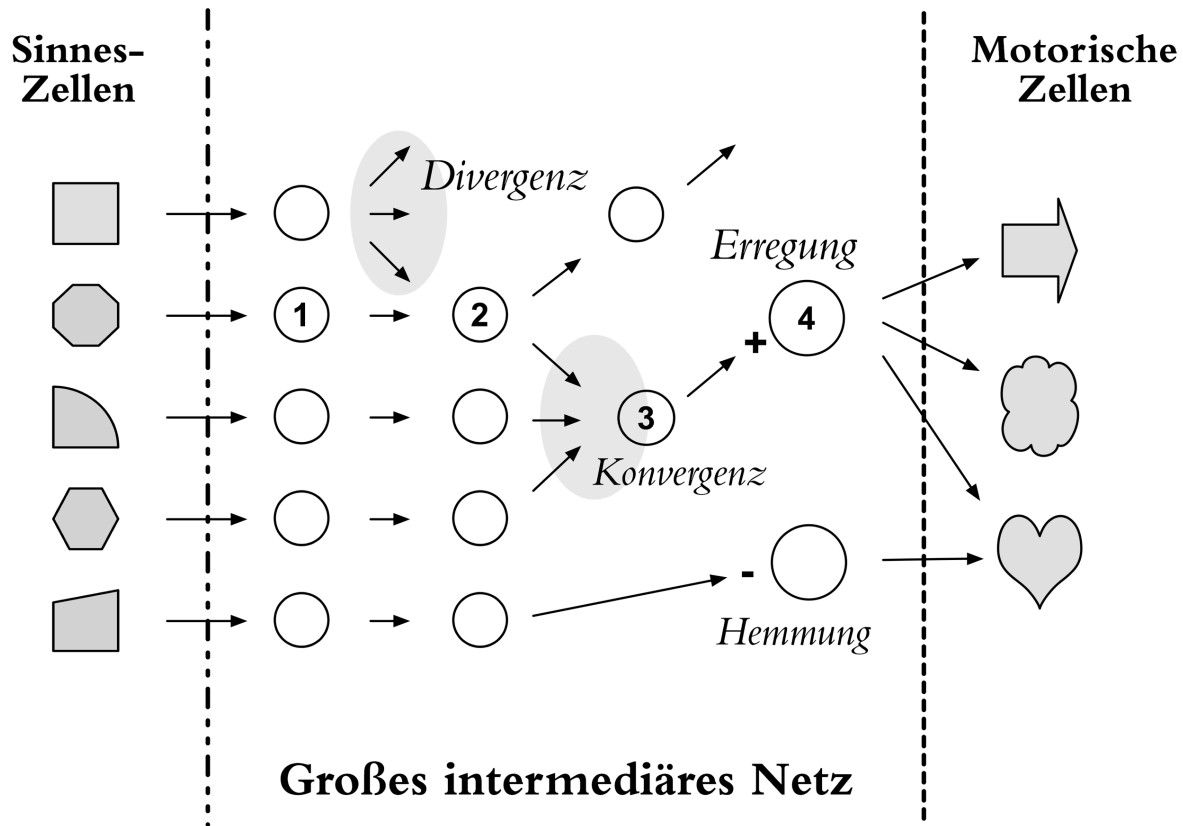
Illusion of Continuity



Picture by the  
anaesthesiologist  
Dierck Schwender,  
who became  
an artist



# principle structure and function of brains

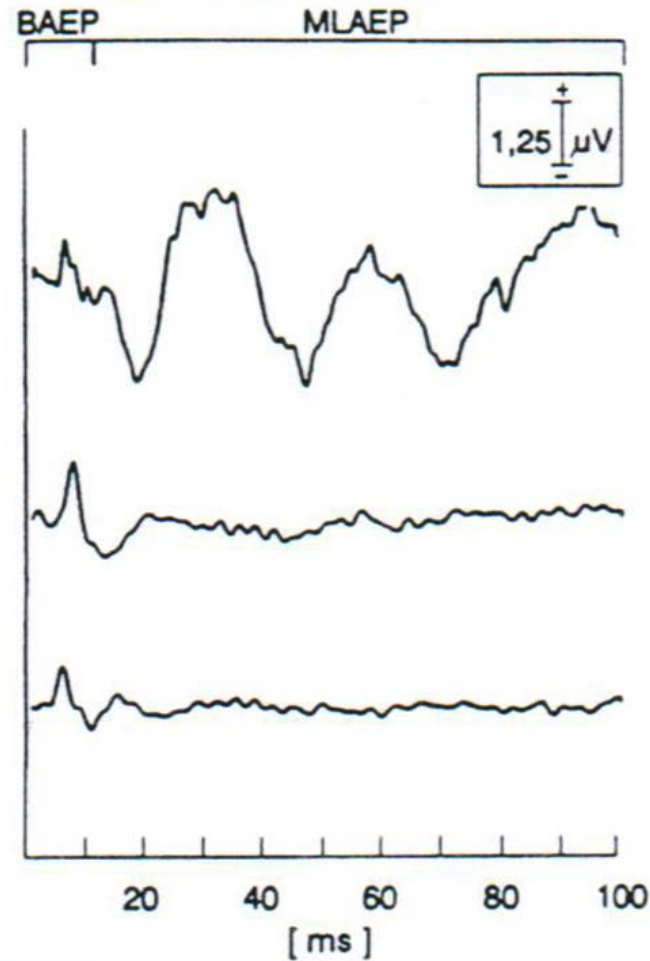


## Nauta's Law:

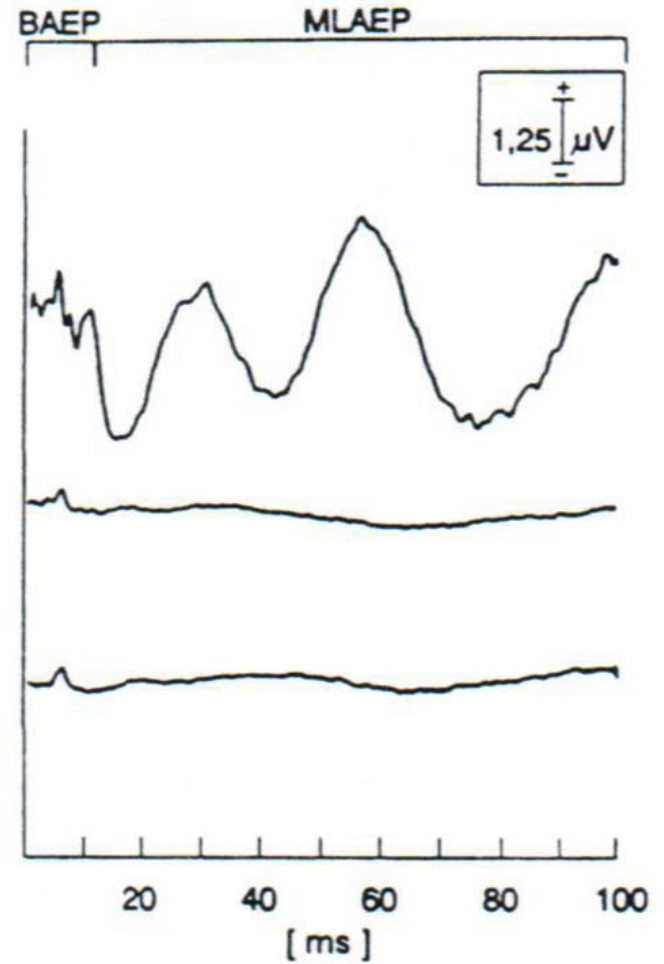
The maximal distance of neurons is four intermediate neurons or synaptic contacts.  
Consequence: extremely dense connectivity



Auditory Evoked Potential

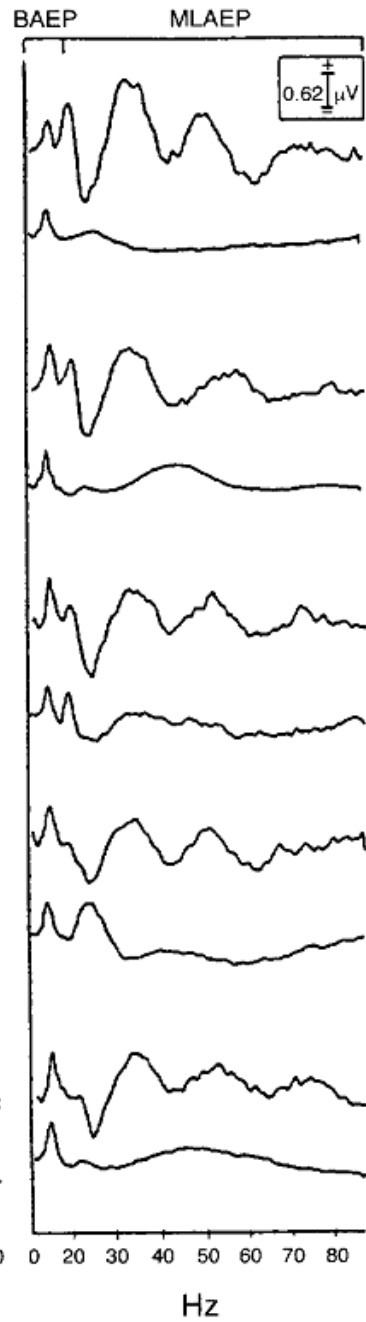
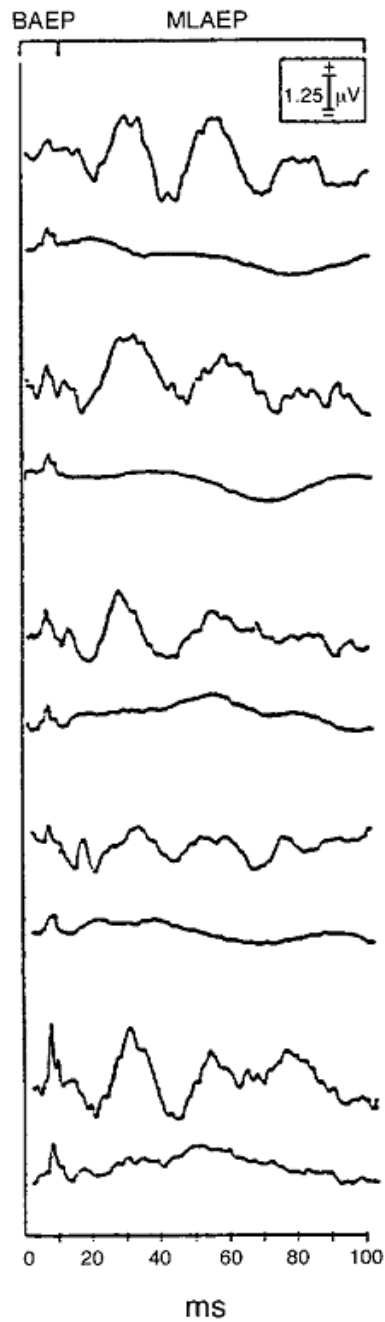


Auditory Evoked Potential



Auditory evoked potential

AEP (grand average)



Awake

Isoflurane  
(1.2 vol.%)

Awake

Enflurane  
(1.6 vol.%)

Awake

Thiopentone  
(5 mg kg<sup>-1</sup>)

Awake

Etomidate  
(0.3 mg kg<sup>-1</sup>)

Awake

Propofol  
(2.5 mg kg<sup>-1</sup>)

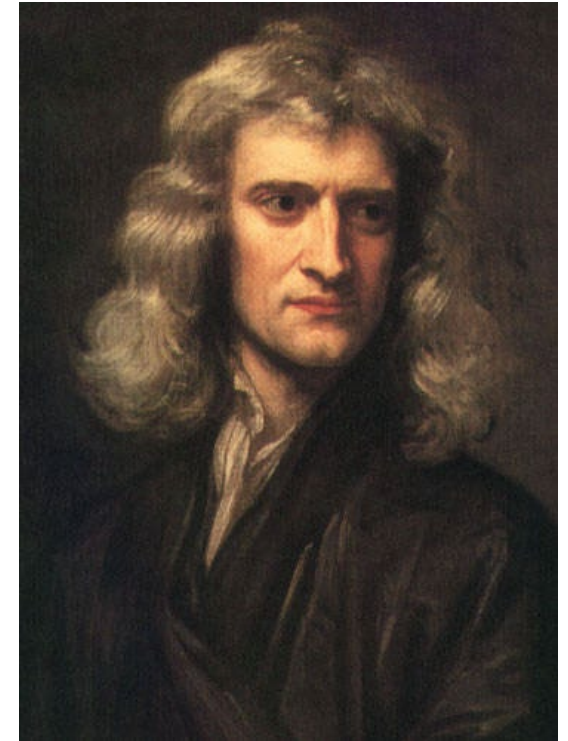
## Isaac Newton: Principia Mathematica Philosophiae Universalis

“Absolute, true and mathematical time, by itself and from its own nature flows equably without relation to anything external”.

But does subjective TIME, does TIME in the brain, actually flow “equably”, as it is implied in classical physics and also in the theories of relativity?

Or is human TIME (or biological time) segmented using time windows?

**Time is jumping – illusion of continuity**





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Speed of recognition

Too fast to be understood



Roman  
Ossipowitsch  
Jakobson

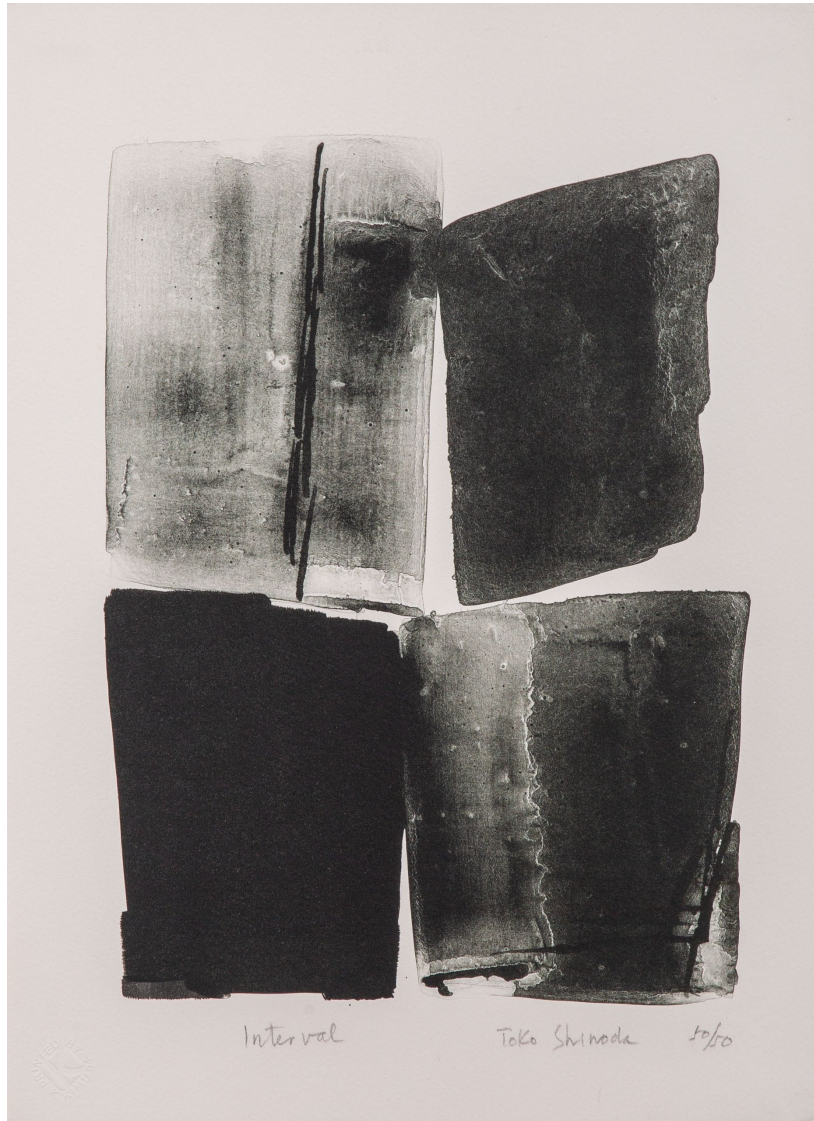


Picture by  
LaoZhu  
Chinese artist



Picture of a raven  
by Koson,  
Japanese artist





Toko Shinoda

Japanese artist,  
more than  
100 years old



Acquarell by  
Nikita Sergejewitch  
Chruschtschov

Guest Scientist



Anne Holefleisch

German artist,  
who locked herself up  
for one year  
to paint faces.



Janet Brooks Gerloff  
American German artist

Mephisto: From a series  
of pictures about the  
kitchen of the witch  
Goethe, Faust



# Construction of images

Point to Point?  
With a Sweep?



The future  
has red hair

Poem by  
Heinz Piontek

from a project of  
Maria Reinisch,  
VDW

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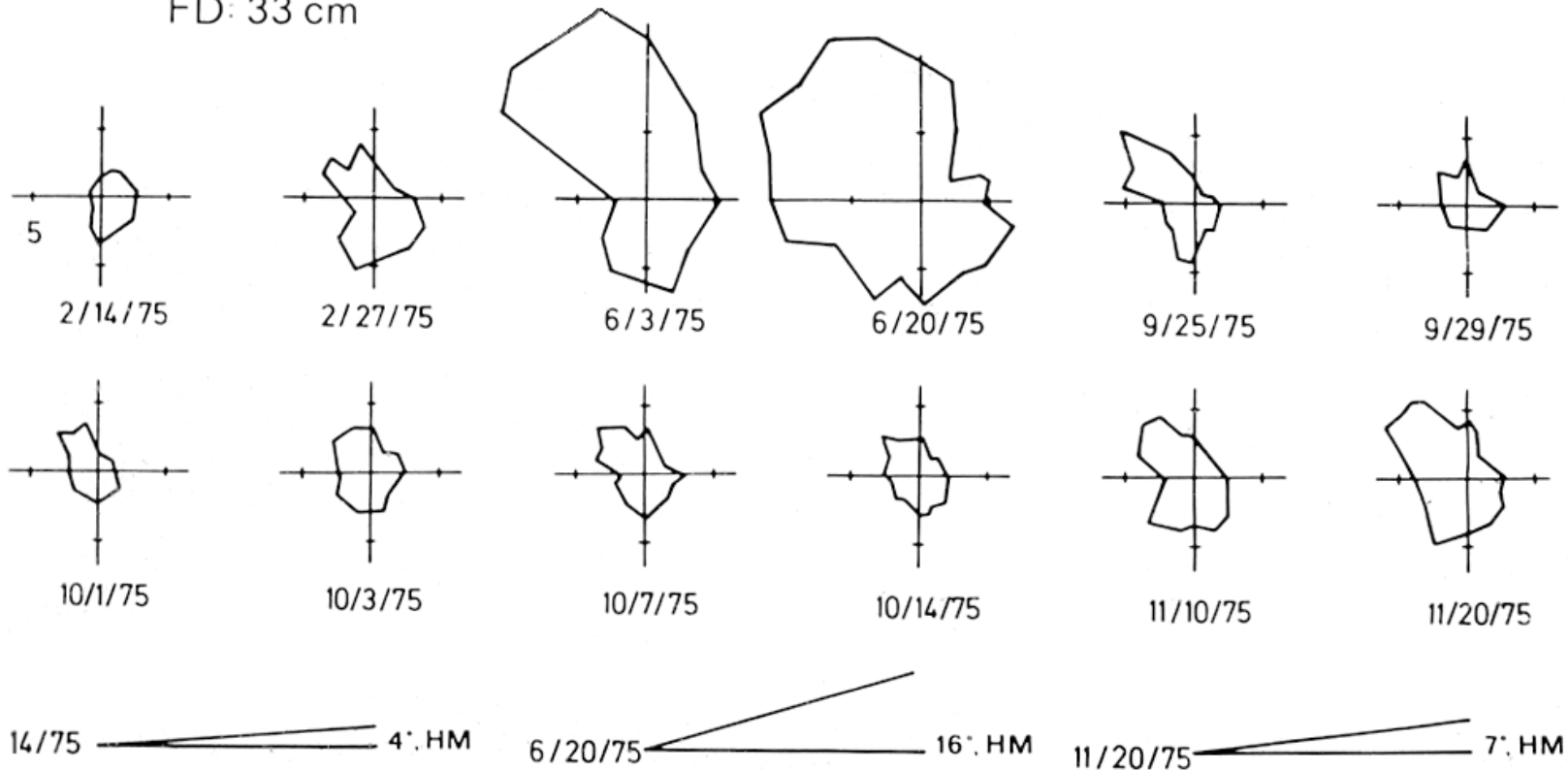
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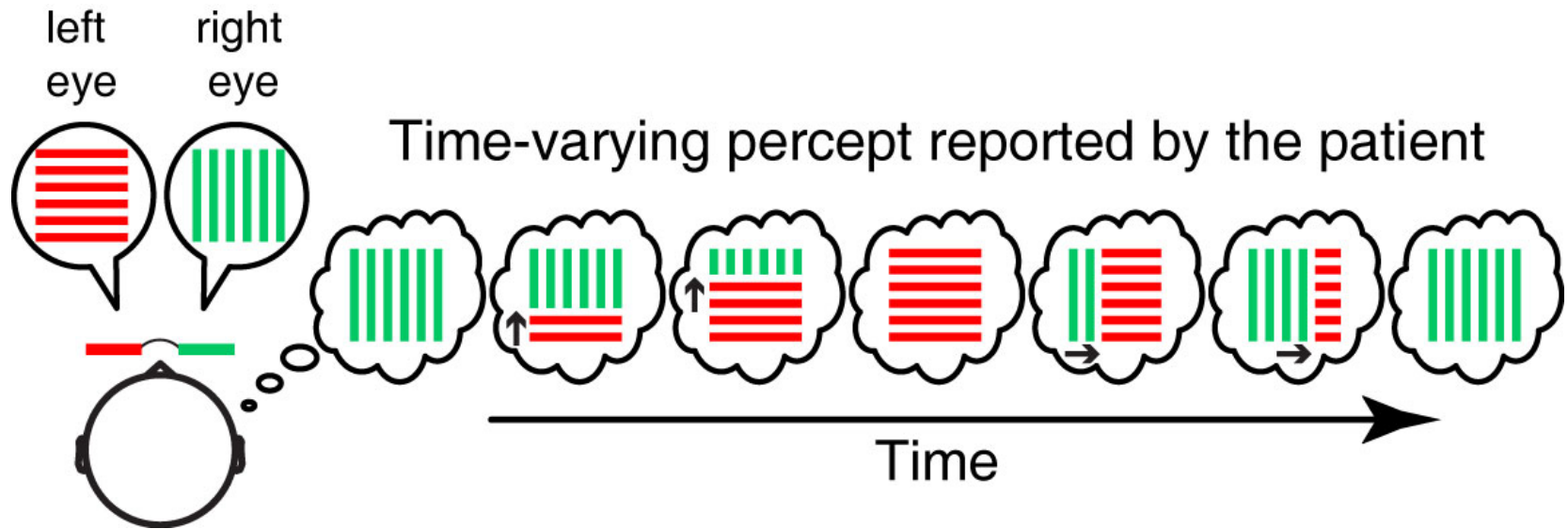


E. Pöppel et al.

Pt. H.H., Ø BVF  
FD: 33 cm







Hypothesis: Percepts are built up sequentially by **disinhibition.**

Slowing down provides a „temporal microscope“



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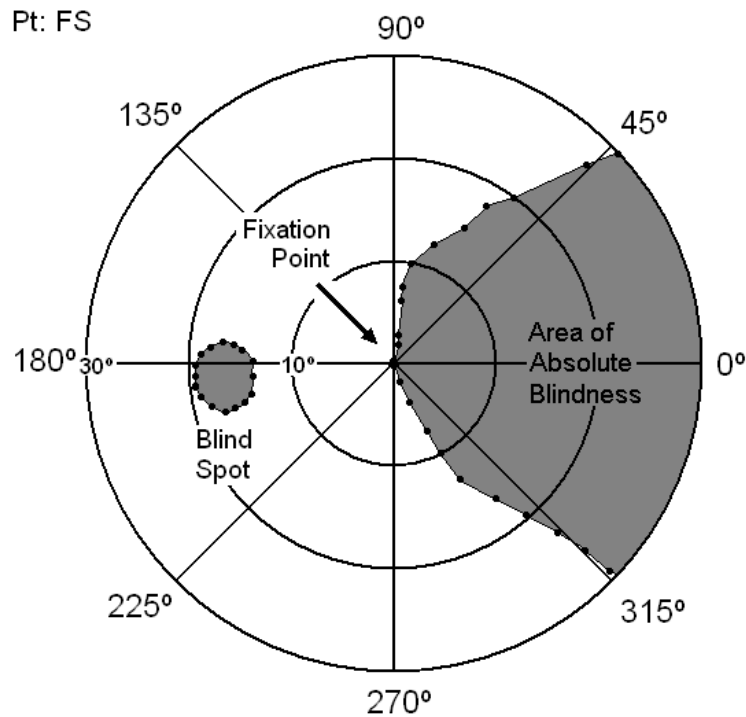
# Illusion of understanding

## Mapping from thinking to talking



Prof. Victor  
Markovitch Shklovski

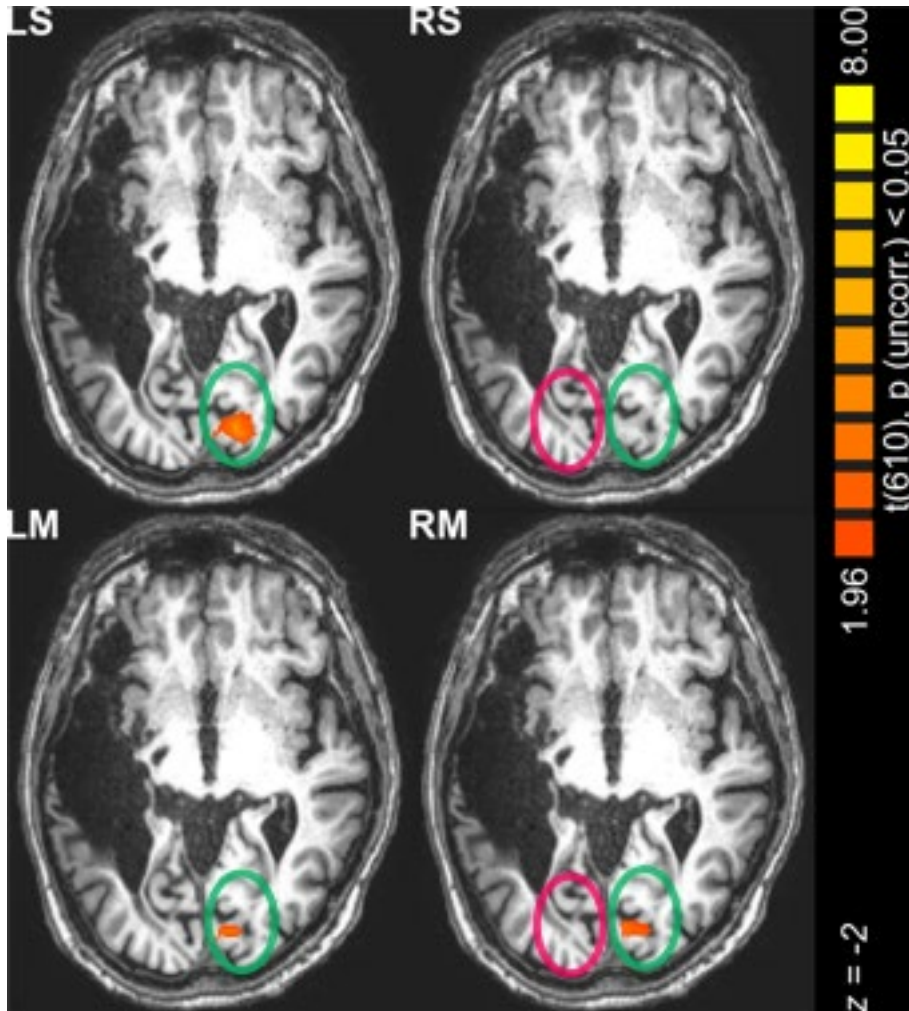
Moscow  
Center for Speech  
Pathology and  
Neurorehabilitation



Visual Field of Left Eye

Visual field of a patient with a left hemisphere injury affecting the optic radiation and language areas

**“My thoughts do not find the words anymore”**



Bao et al. (2024)  
“Conscious vision in  
blindness: A new  
perceptual  
phenomenon  
implemented on the  
“wrong” side of the  
brain”

## Necessary **competences to communicate**

**Lexical** competence 1: content words (nouns, verbs)

**Lexical** competence 2: function words (articles,...)

**Syntactic** competence (employing rules of grammar)

**Semantic** competence (meaning in sentences)

**Phonetic** competence (using speech sounds)

**Prosodic** competence (expressing emotions)

**Pragmatic** competence (context sensitivity)

**Social competence** (relating to others)

**Cognitive** competence (creating and maintaining identity)

**Temporal** competence (segmenting speech in time windows)

**Where is understanding competence?**

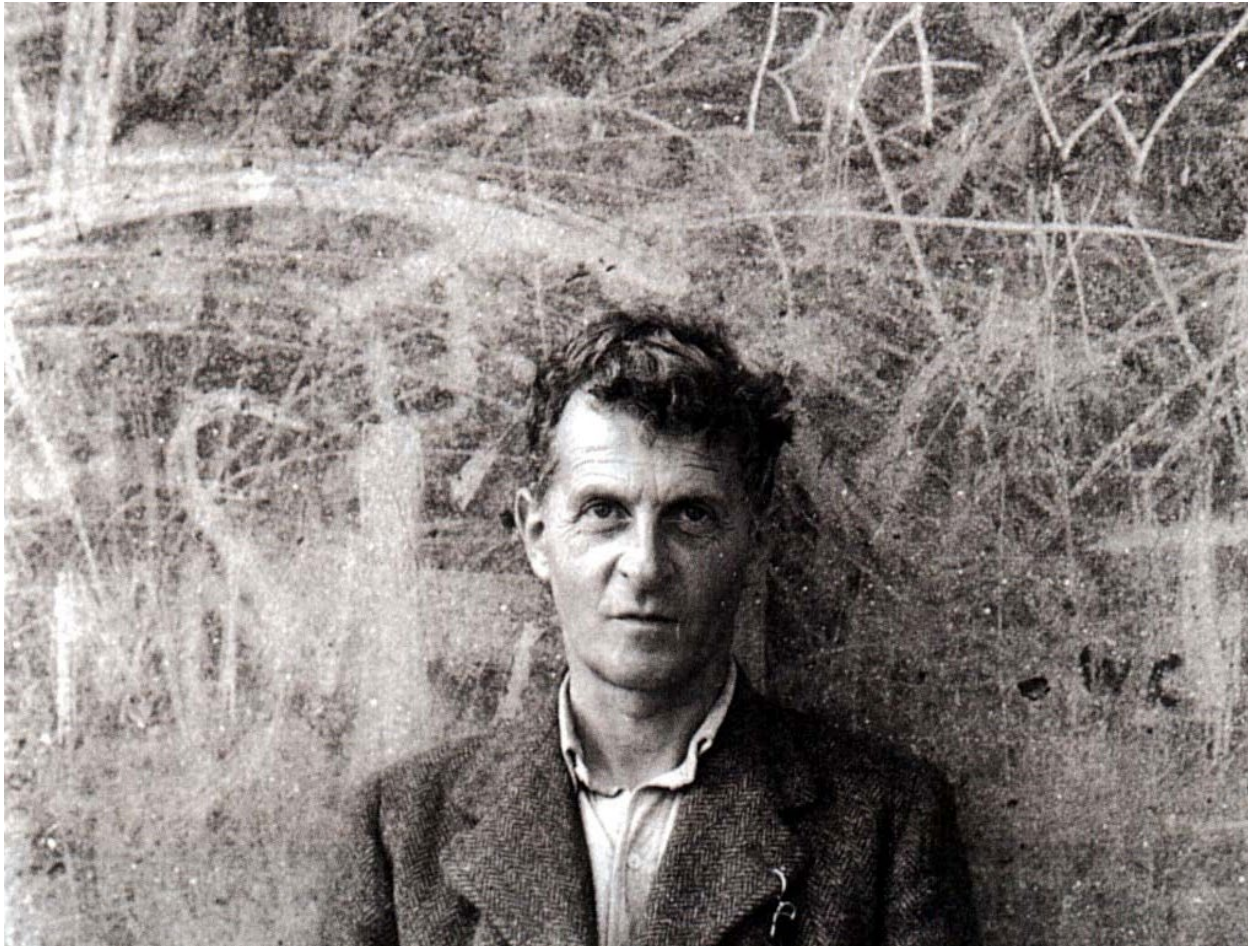


Roman Jakobson, 1896-1982

Ernst Cassirer, 1874-1945

Together on a ship from Norway to the US in 1941  
Was this the place where modern linguistics started?





## Ludwig Wittgenstein (Tractatus)

Wovon man nicht  
sprechen kann,  
darüber muss  
man schweigen.



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