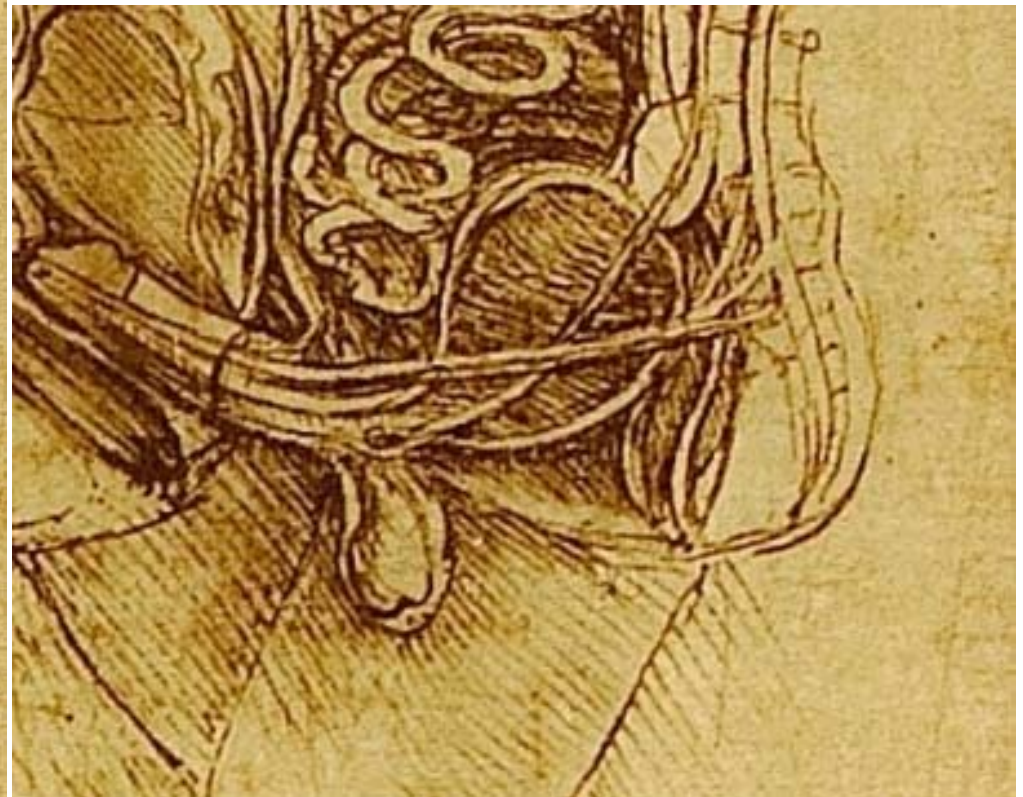
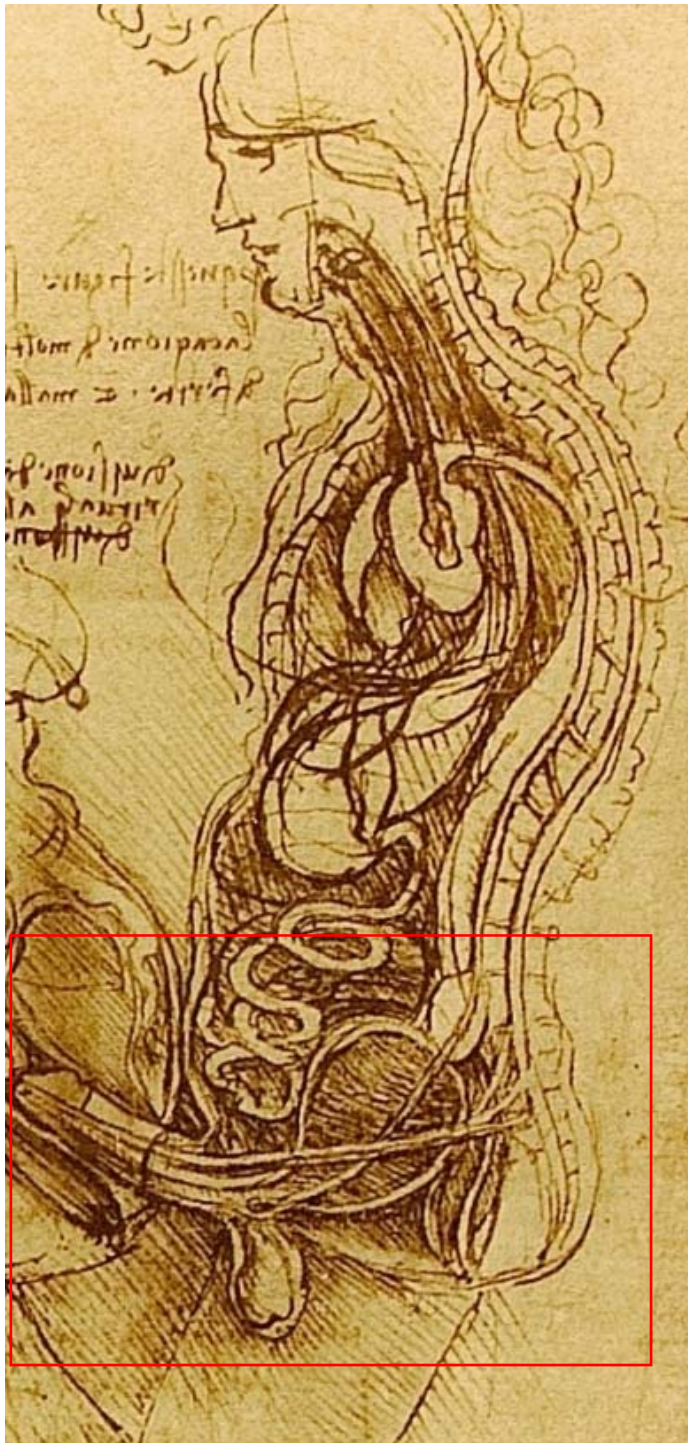


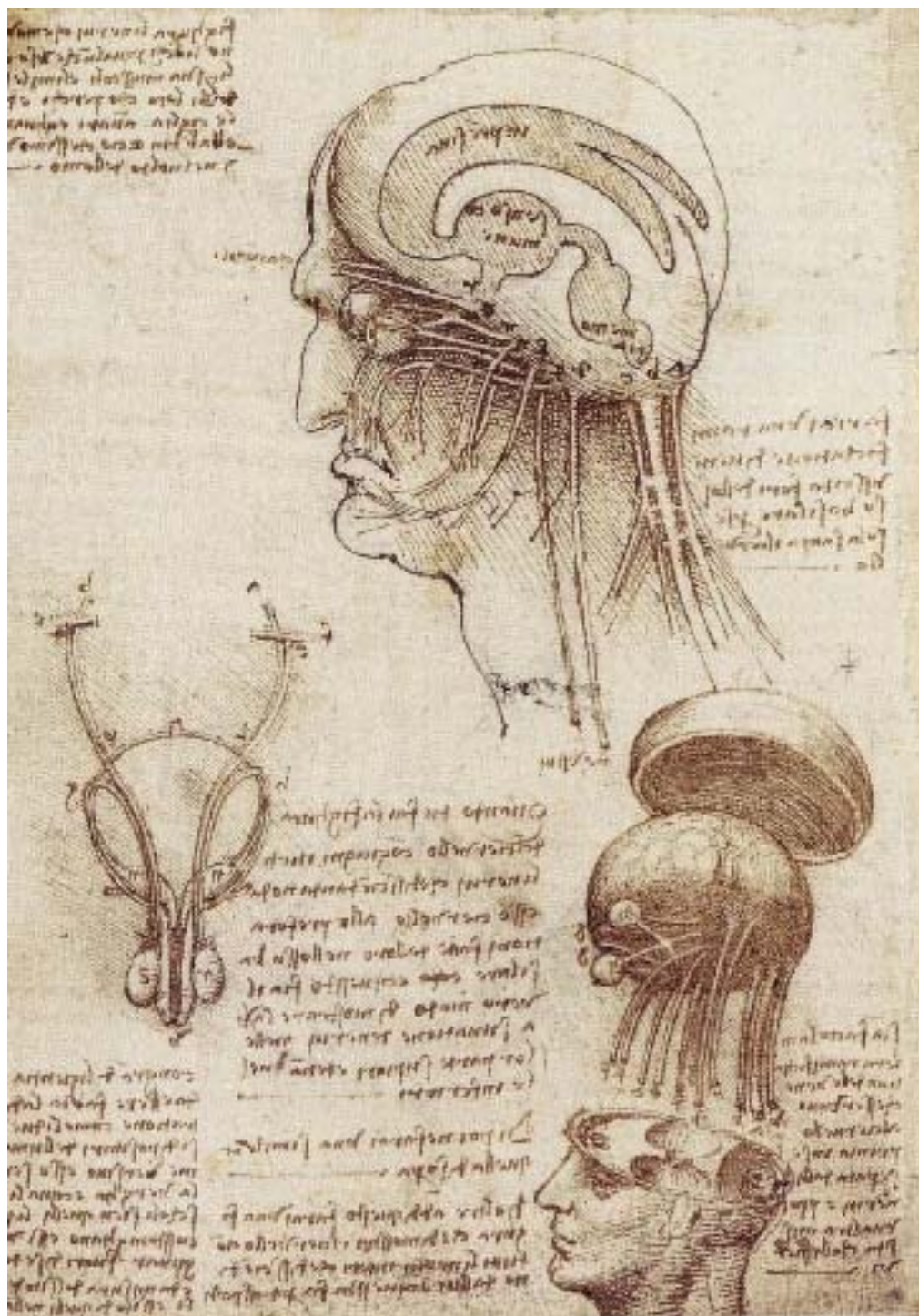


神经系统的功能与演化

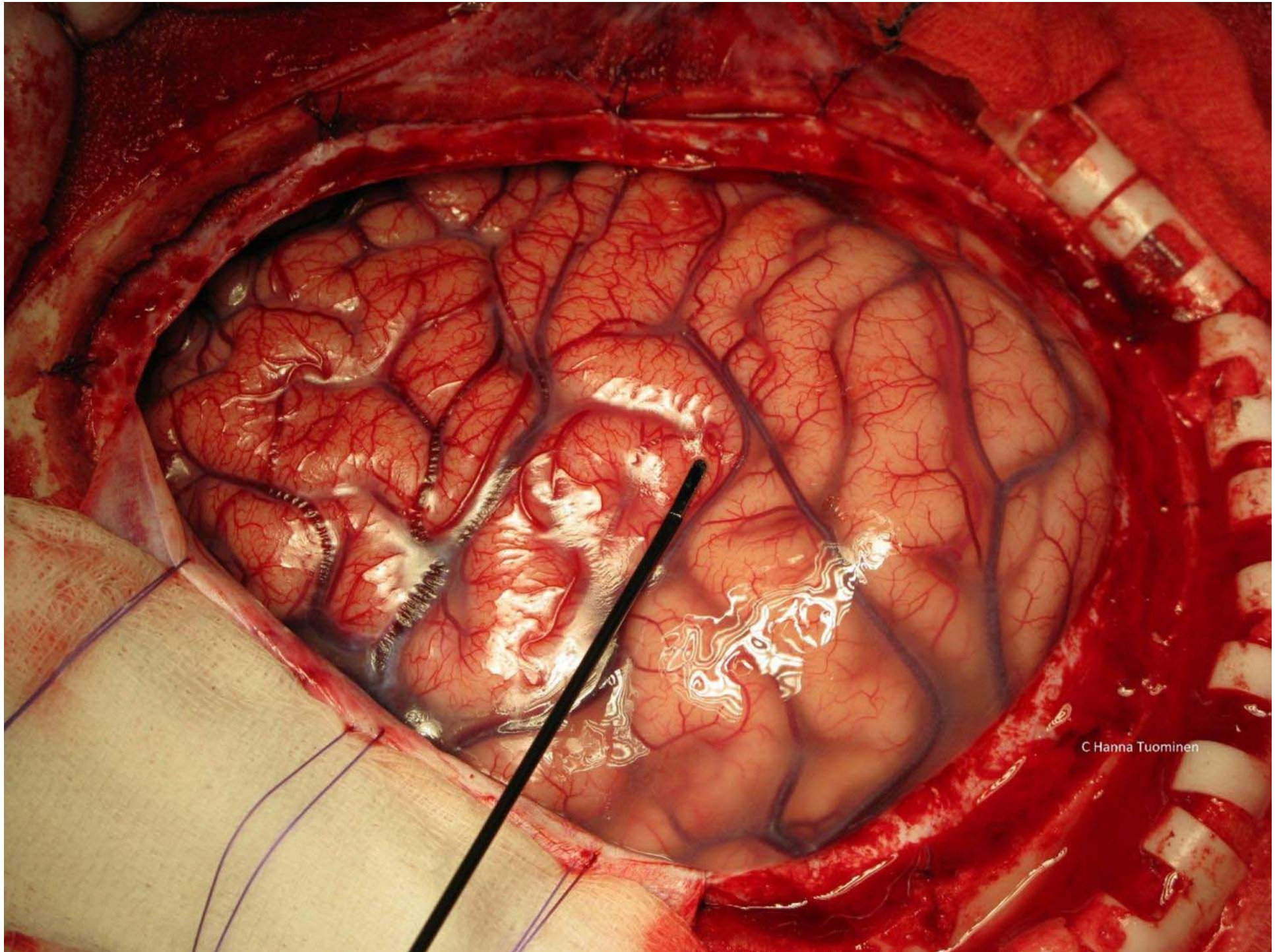
Leonardo da Vinci, Copulation, c. 1493,
pen and ink. The Royal Collection,
Buckingham Palace, London

现在我们都知道脑是思维器官，但不久以前并不是



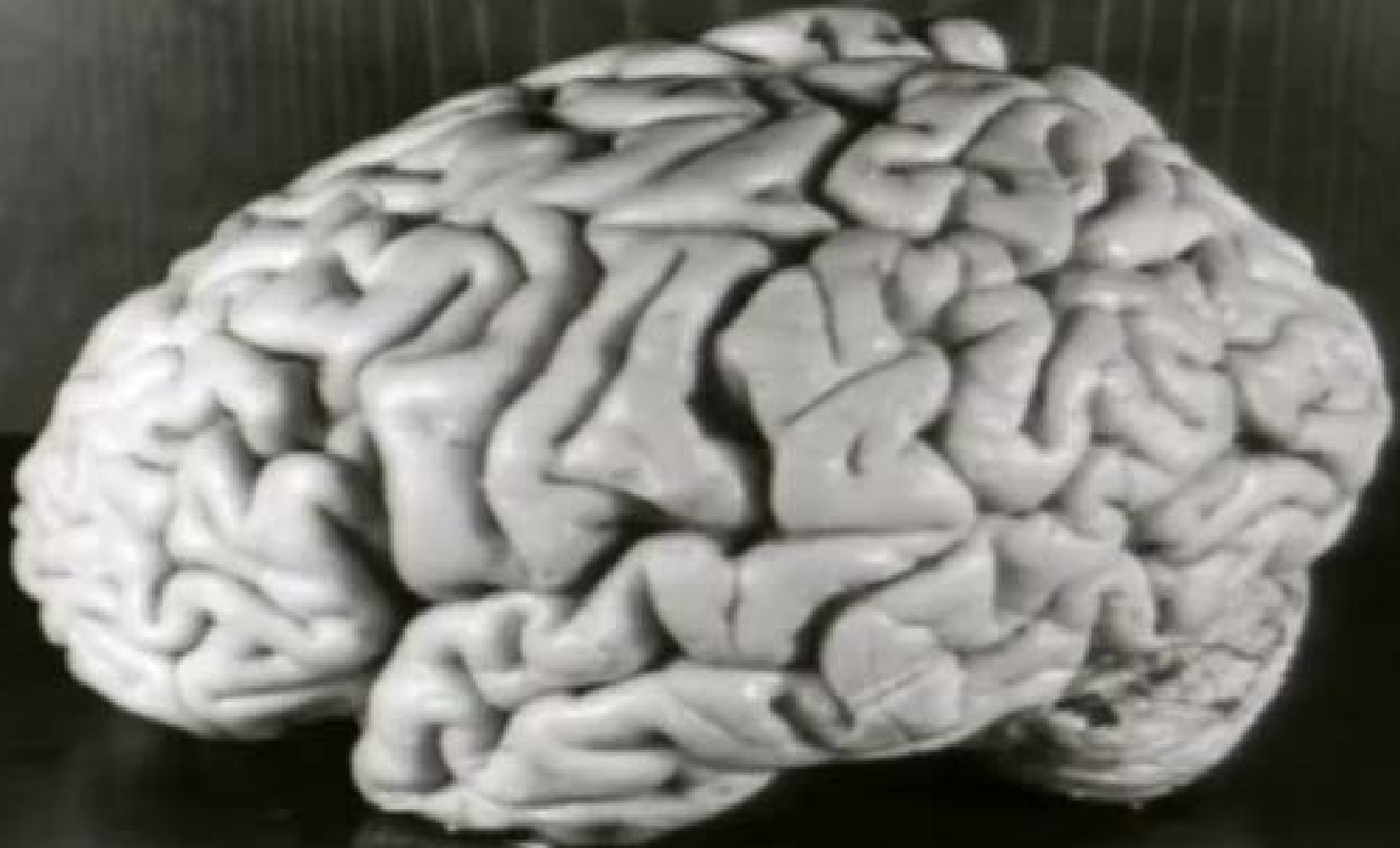


那时候的人们
认为大脑的沟
回也不重要~



C Hanna Tuominen

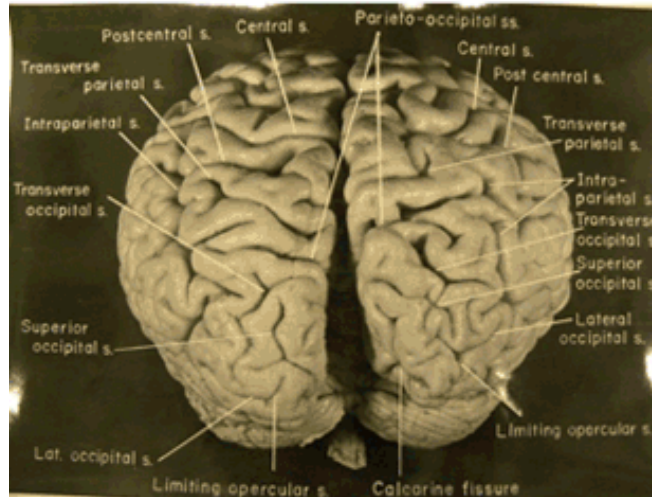
The brain of Albert Einstein 1955



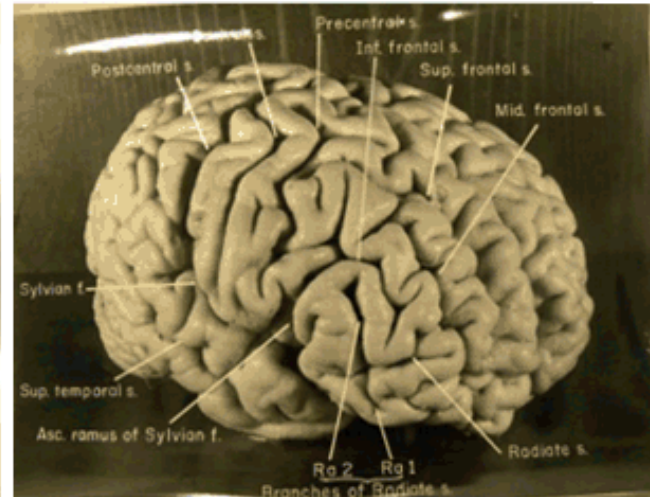
Copyright Dr Thomas Harvey

神经心理学

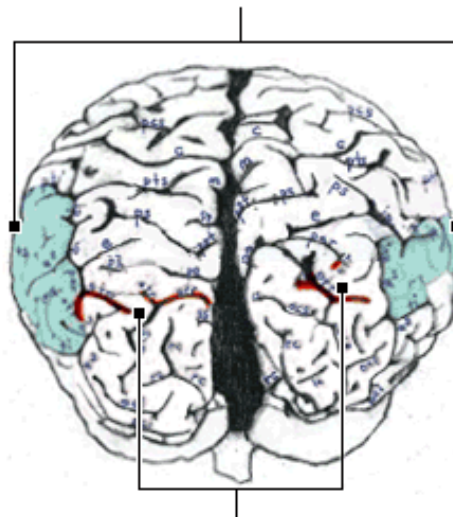
Brain seen from rear



Brain seen from front-left

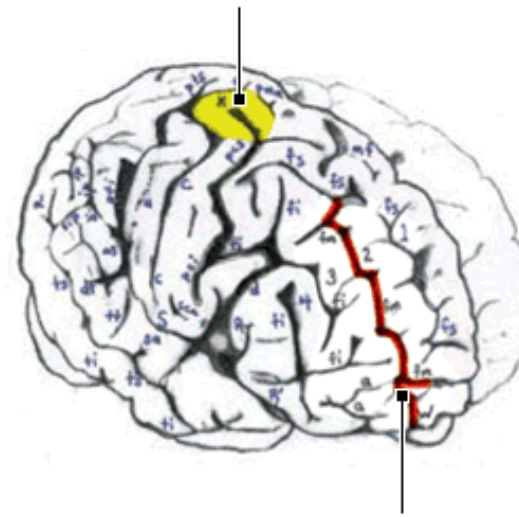


Asymmetric inferior parietal lobes



Highly unusual grooves

The sign of omega



Extra ridge in mid-frontal lobe

爱因斯坦的大脑

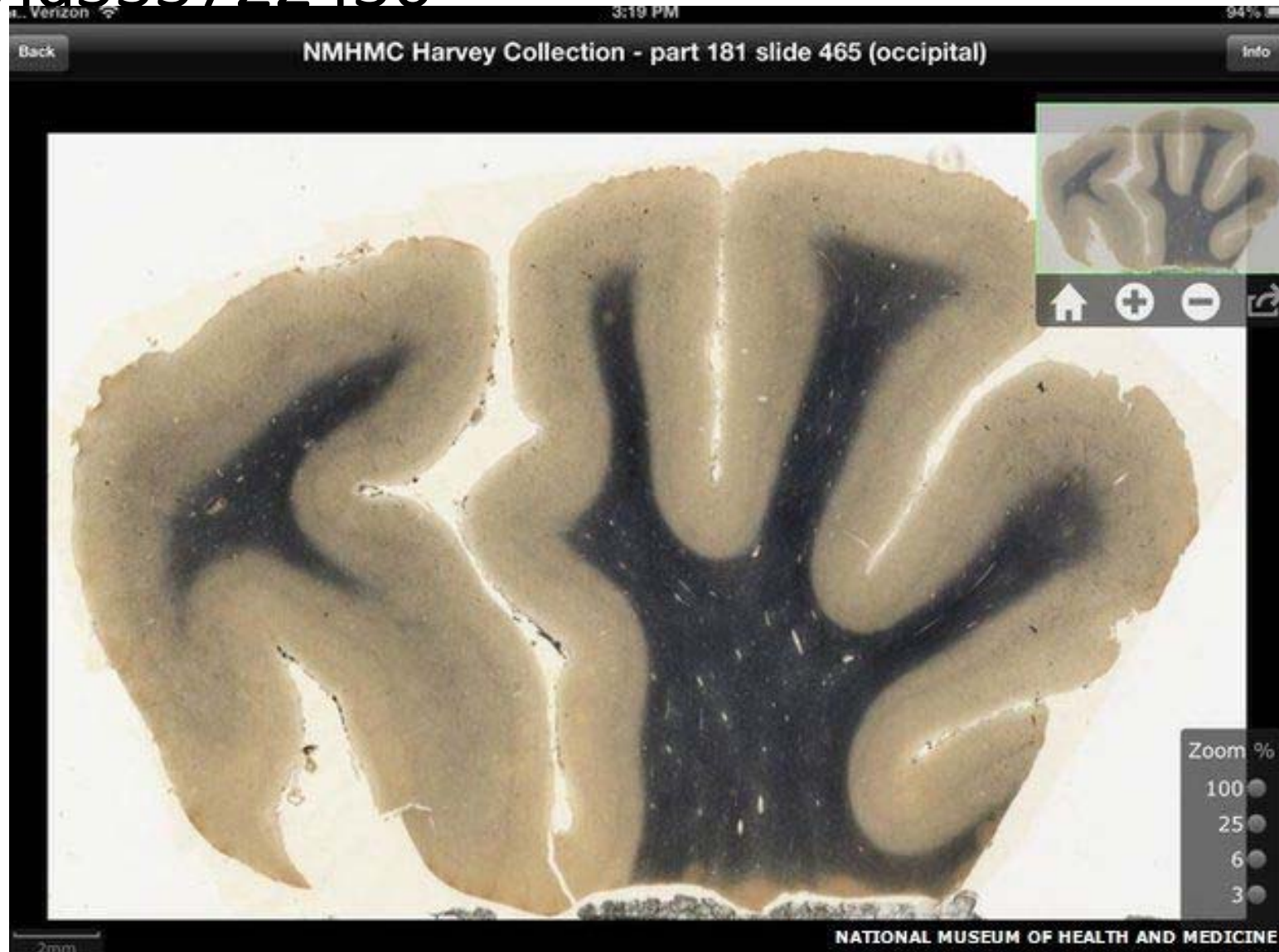
The brain dissected in two



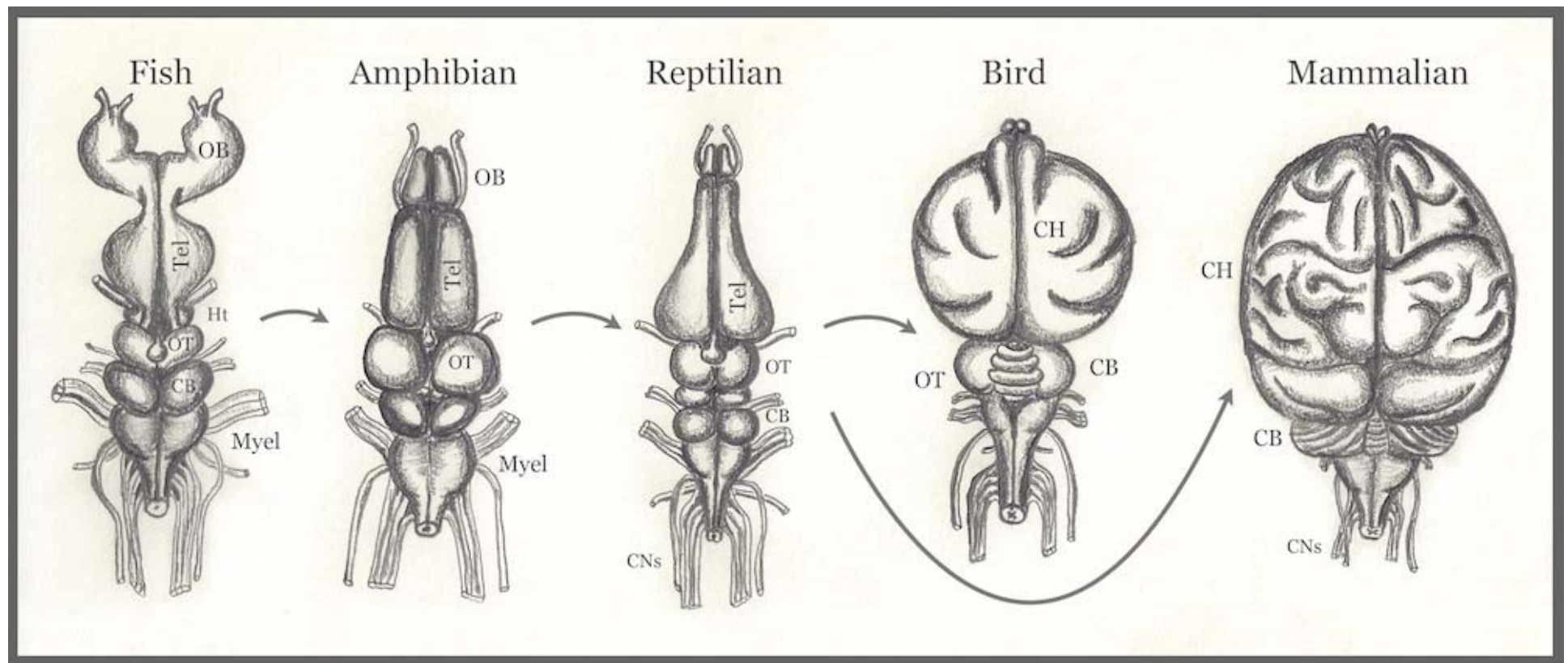
Unusually thick corpus callosum

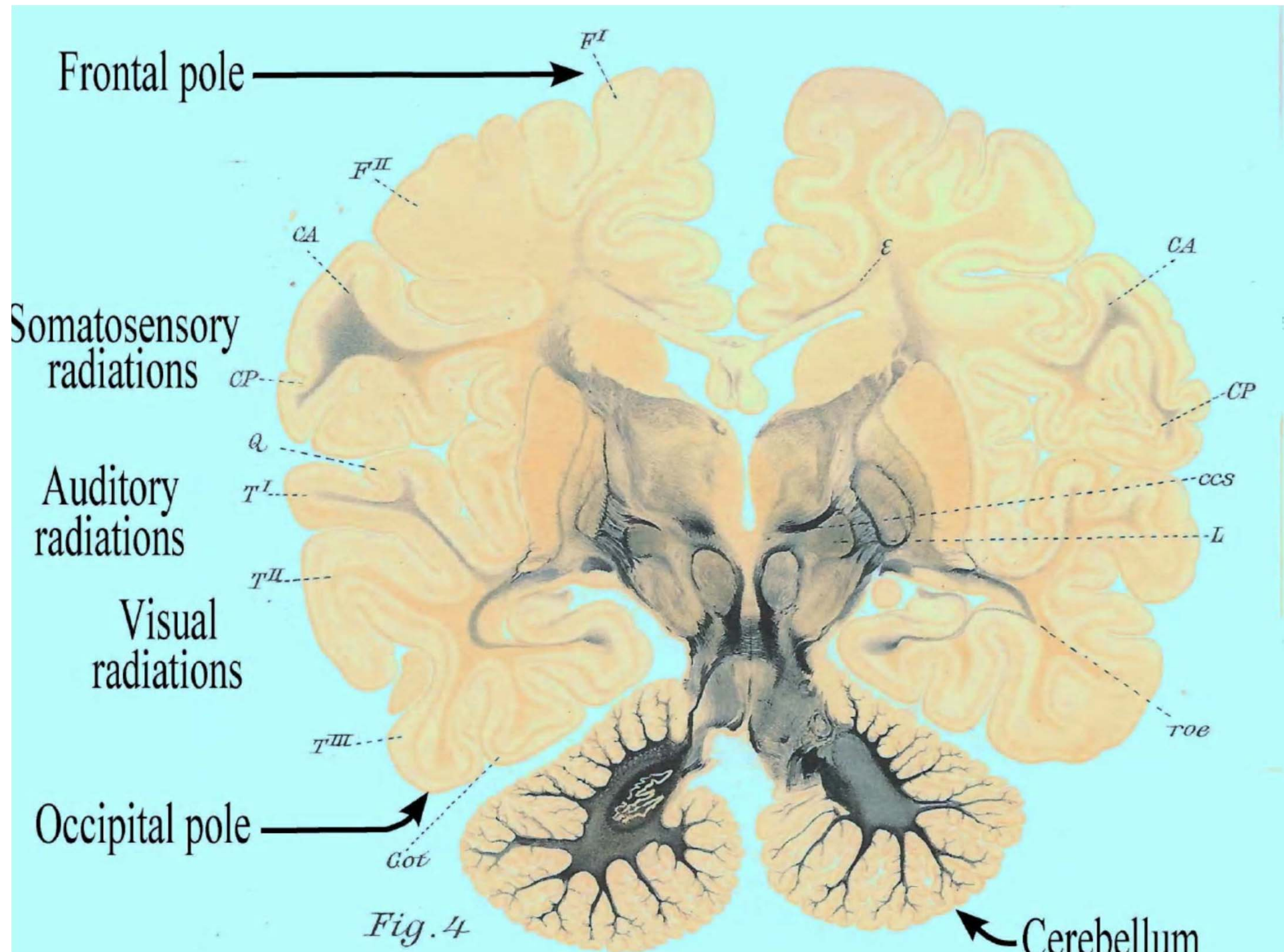
爱因斯坦的大脑

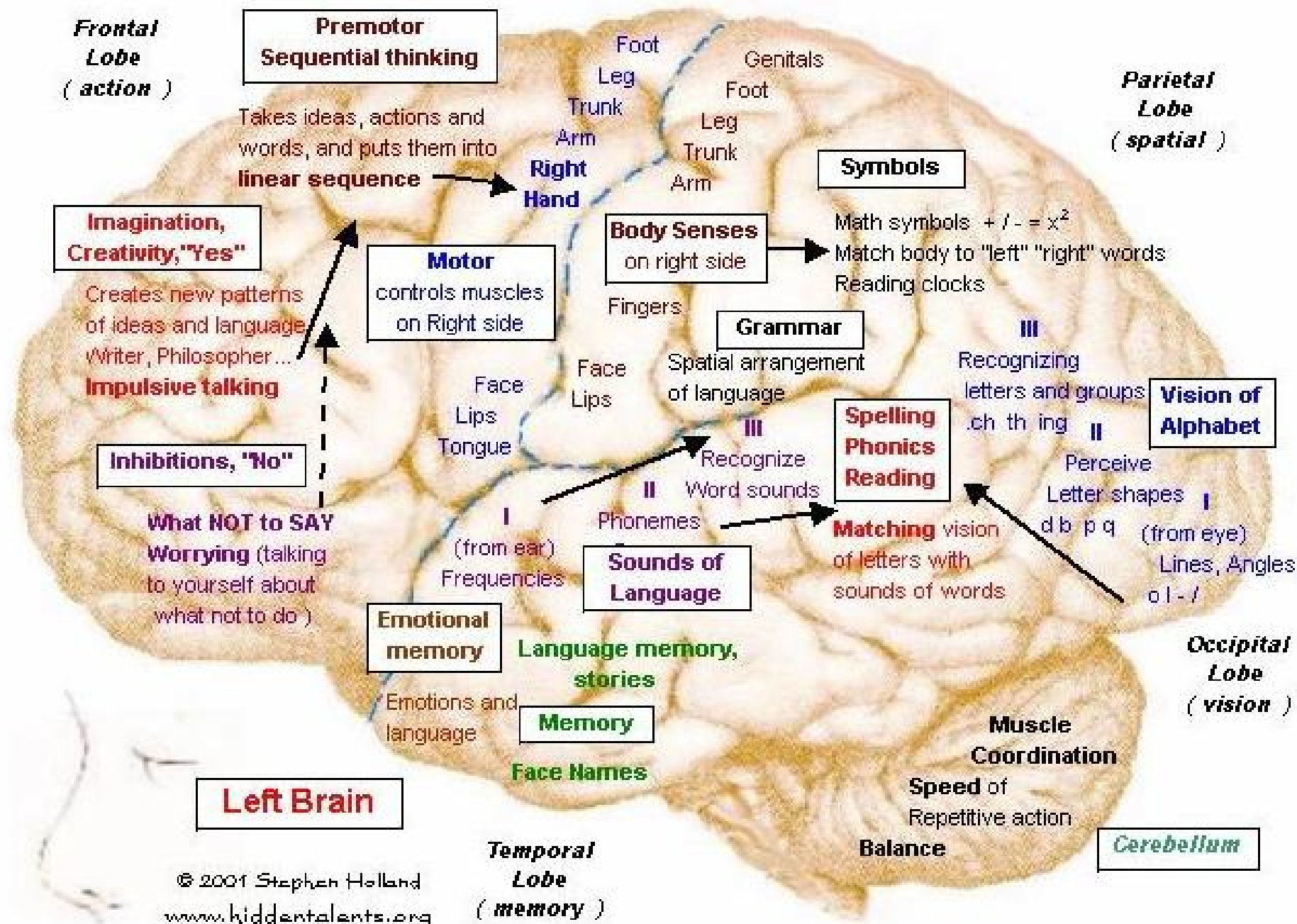
<https://itunes.apple.com/us/app/einstein-brain-atlas/id555722456>

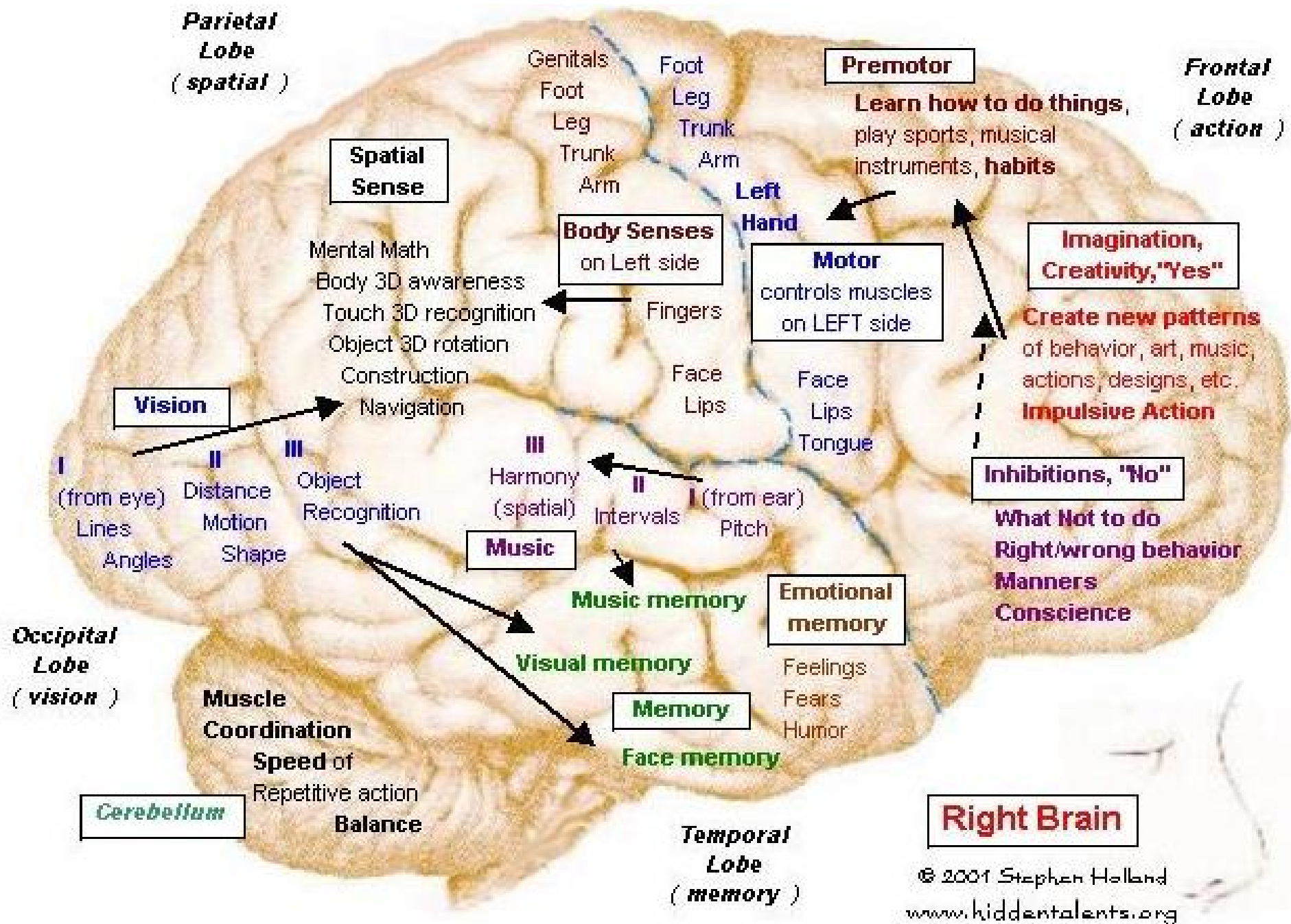


脑的基本模式

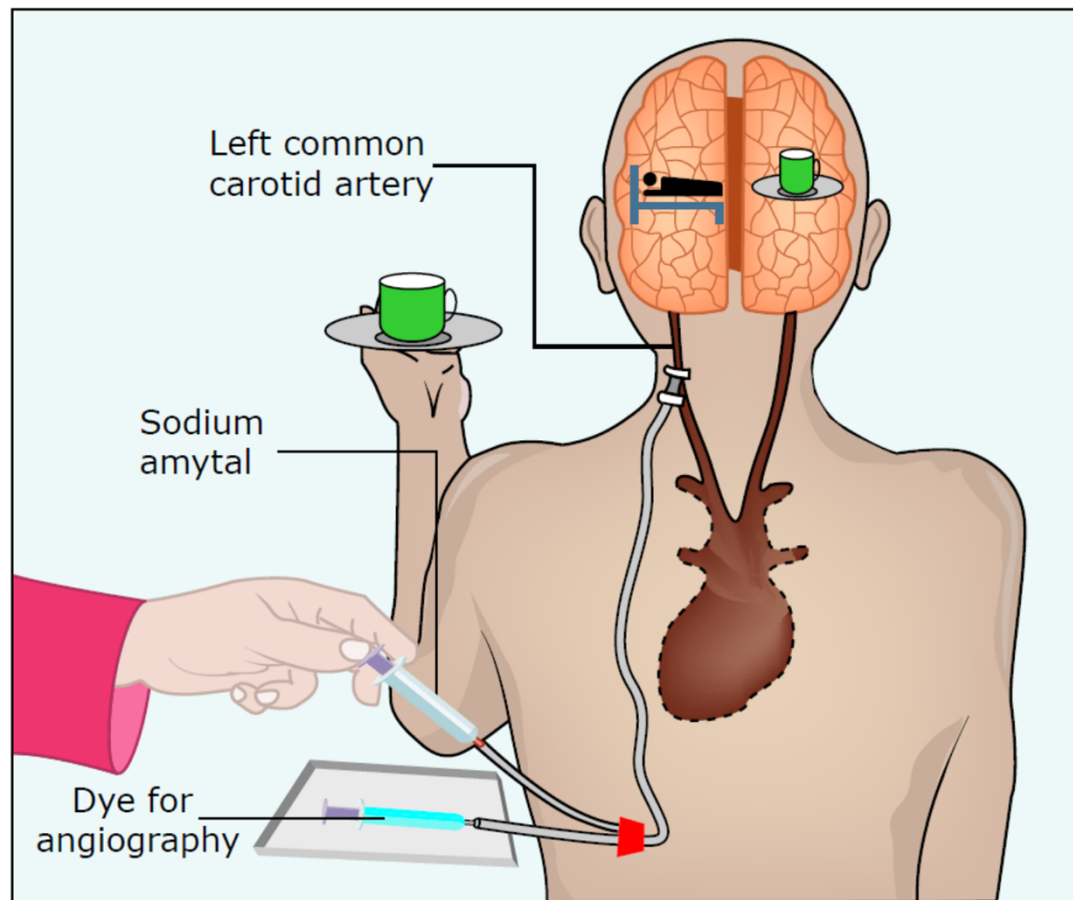




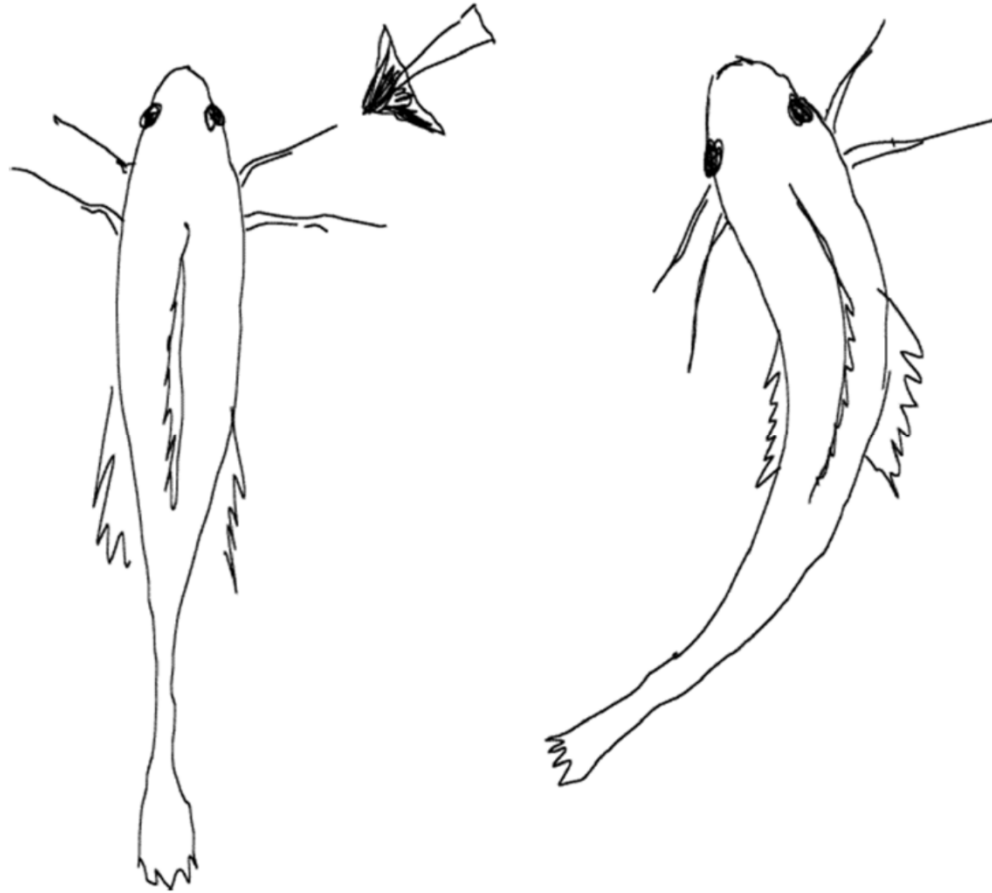


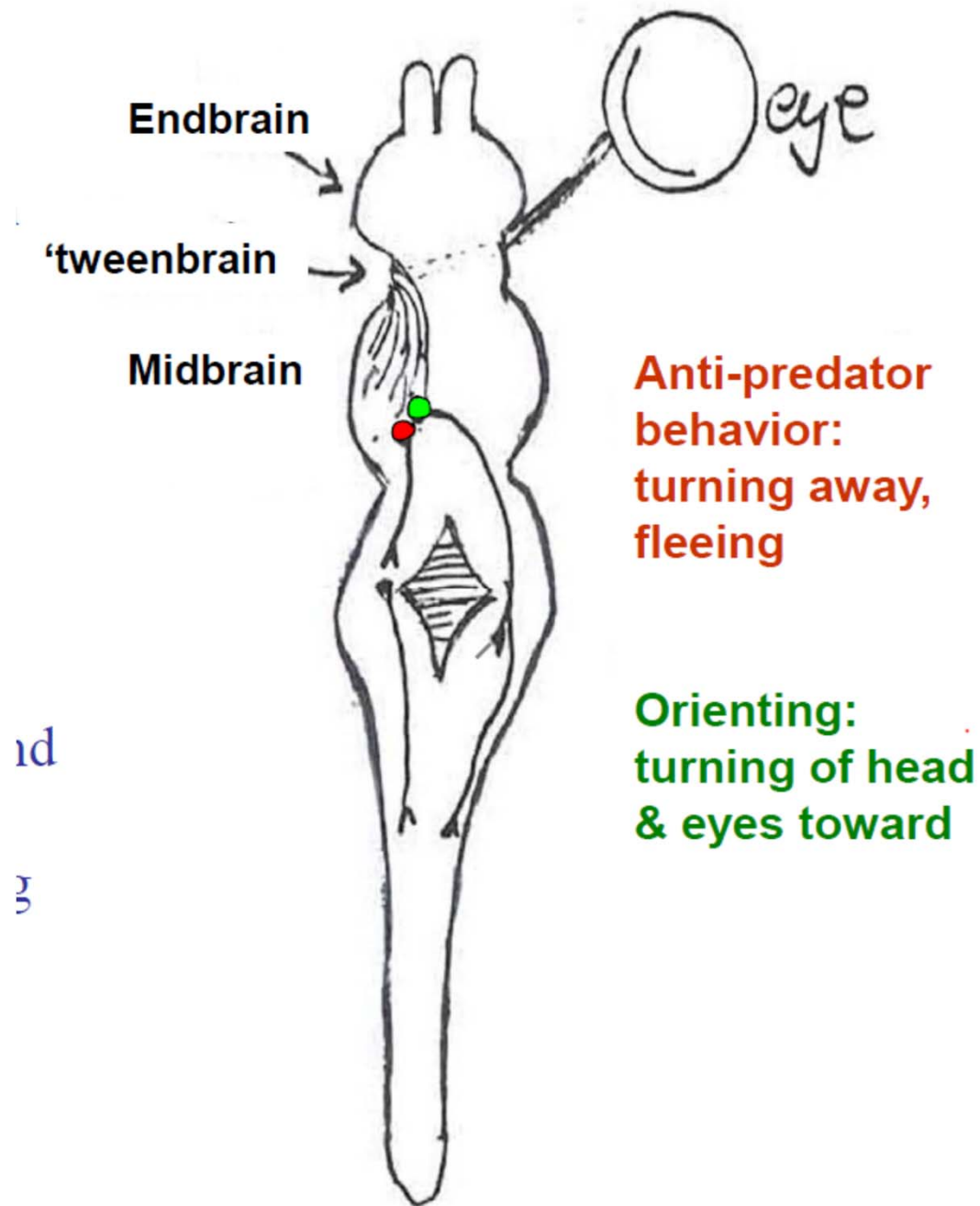


Wada 测试



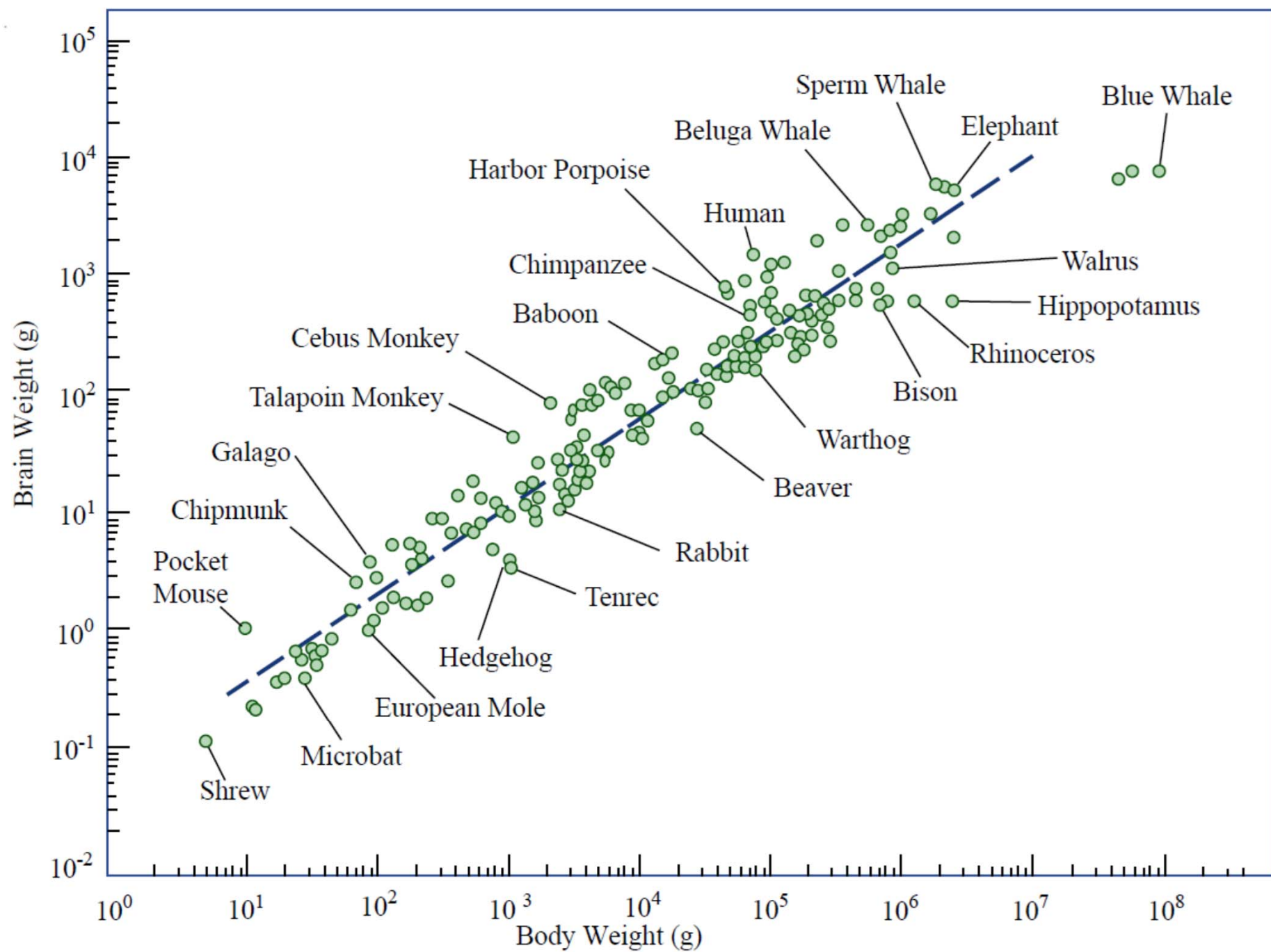
神经交叉？

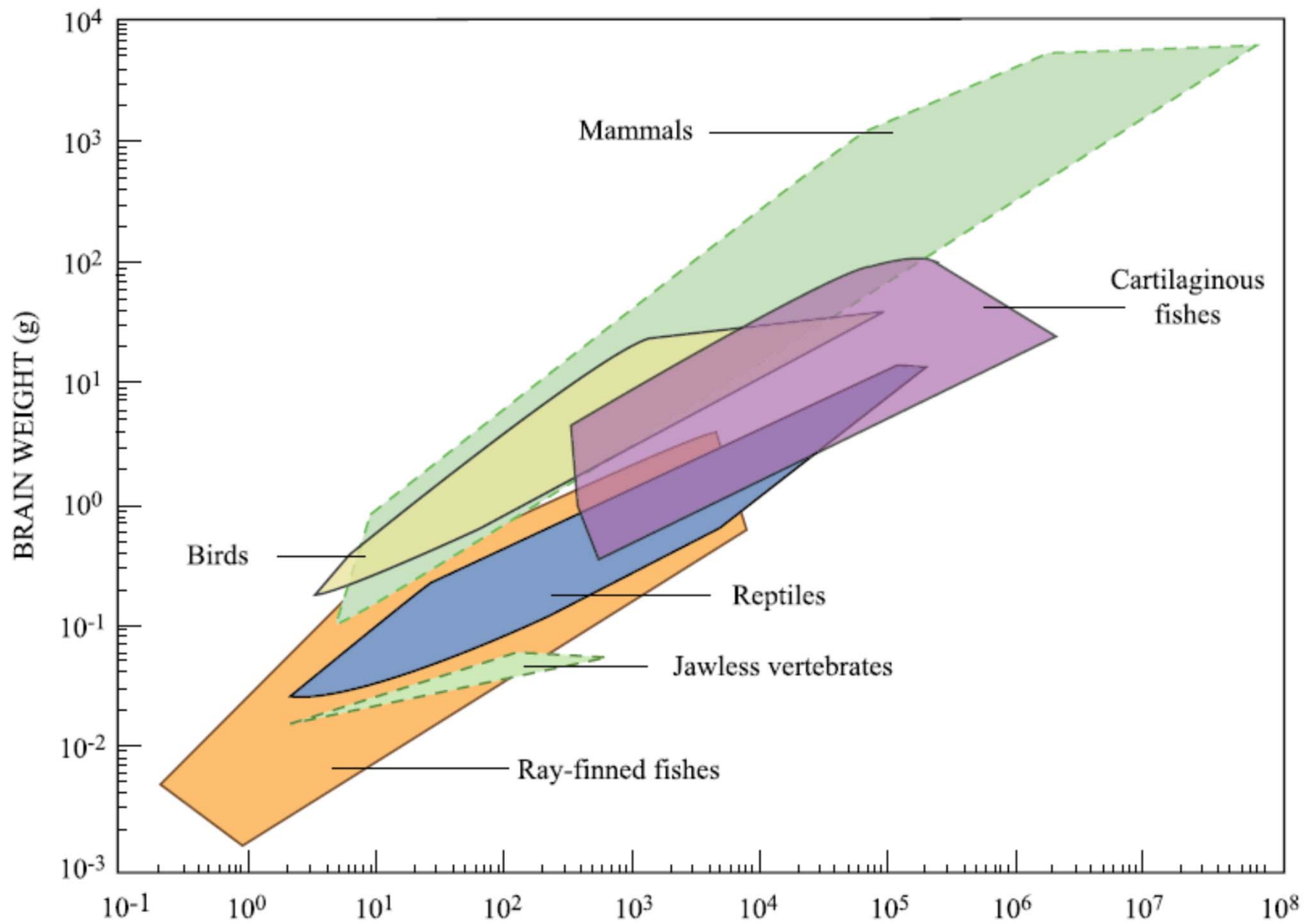


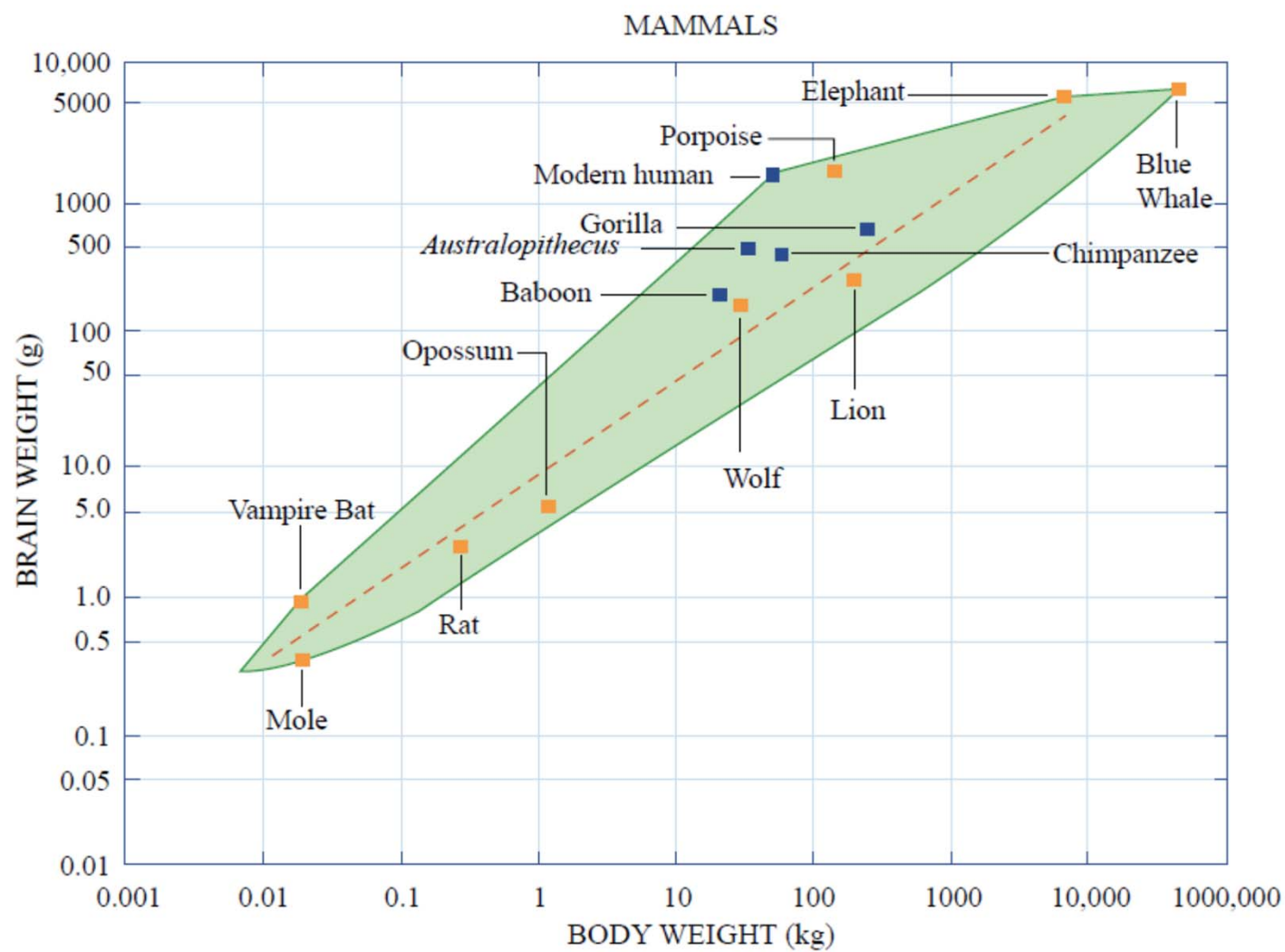


1d

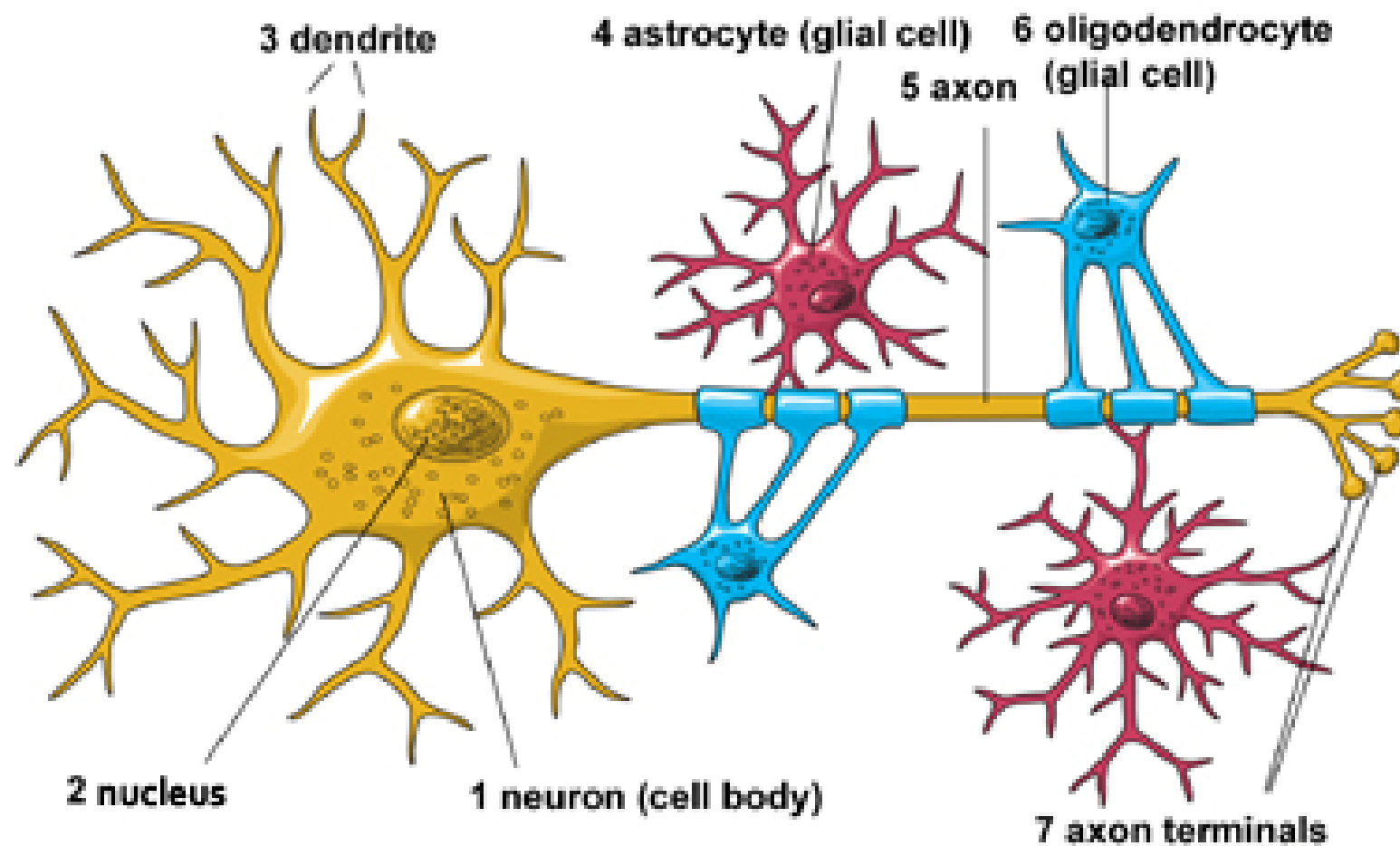
3



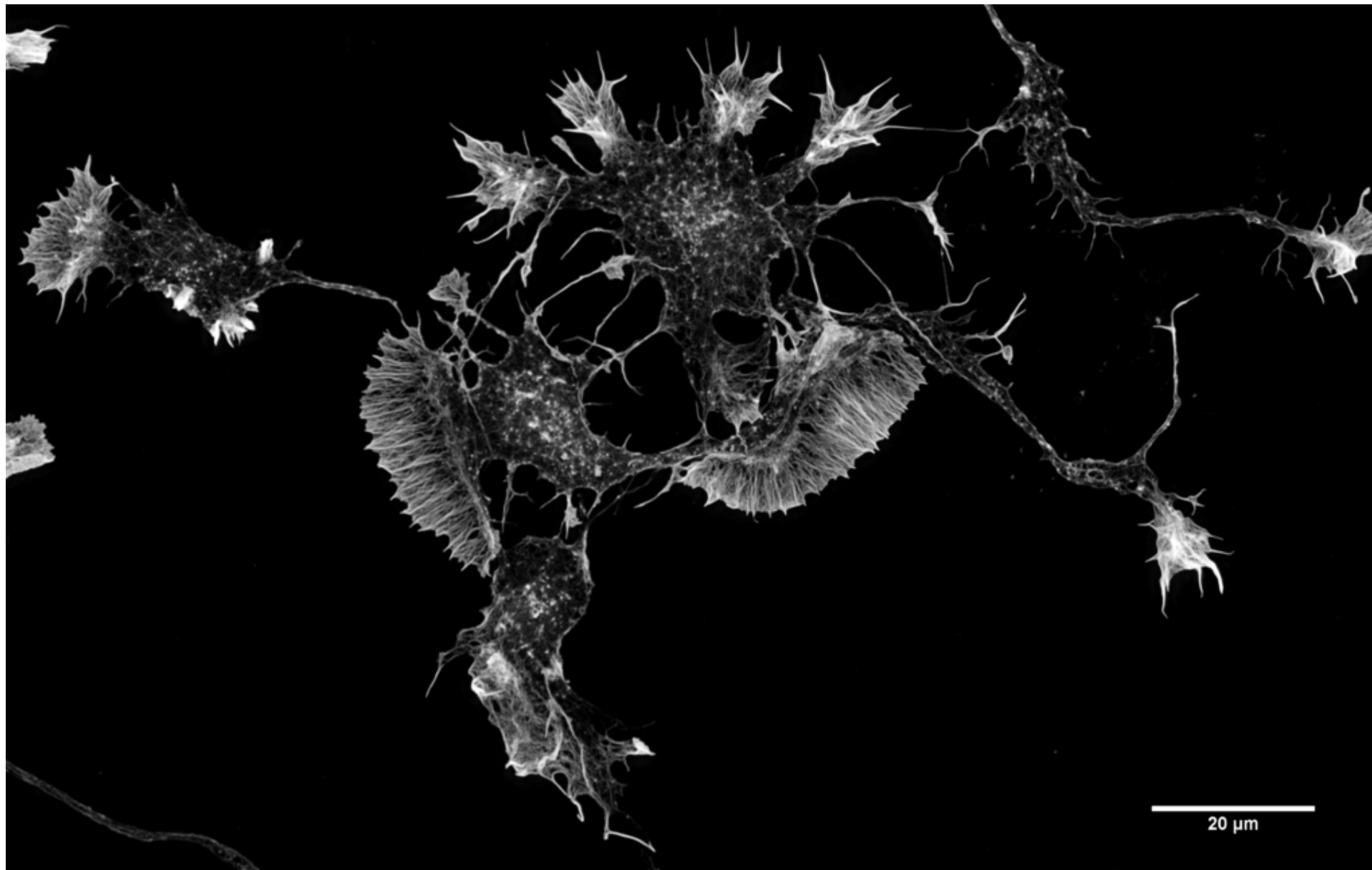




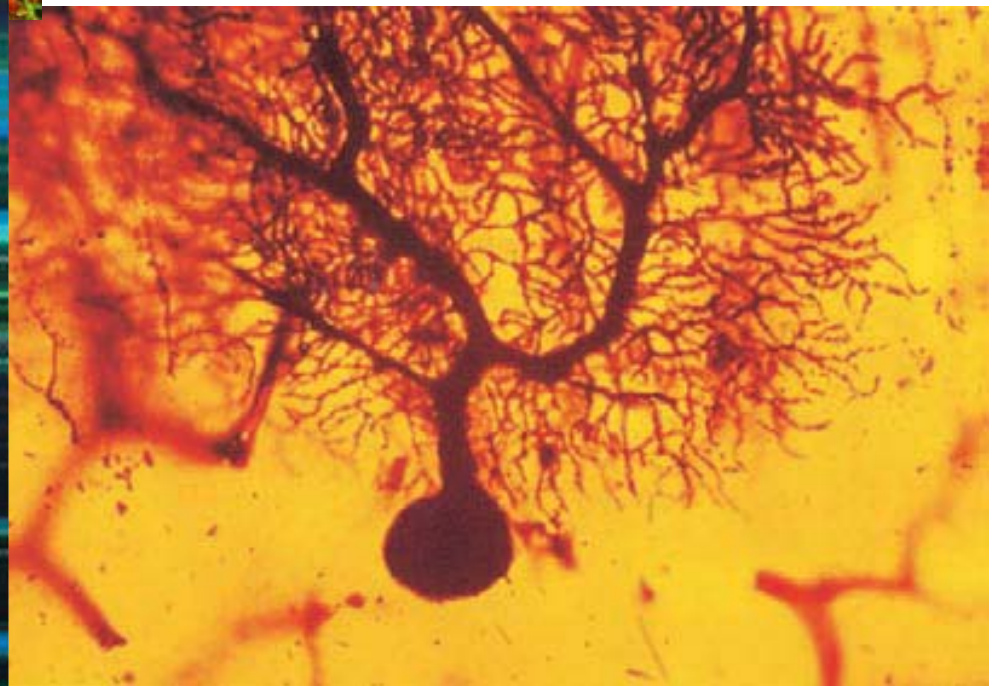
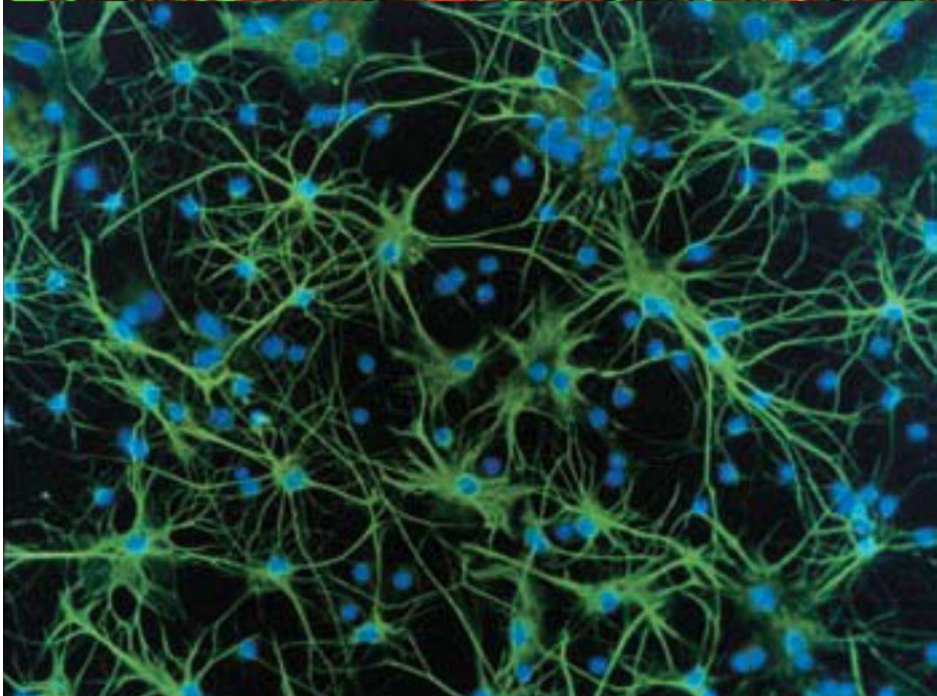
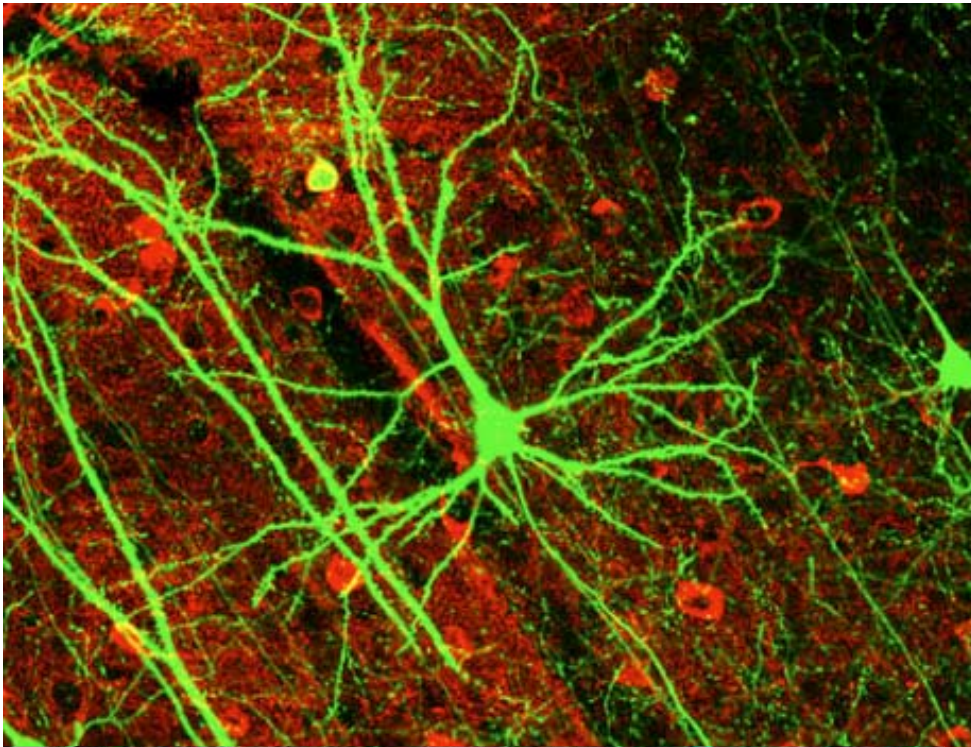
脑的基本组成单元



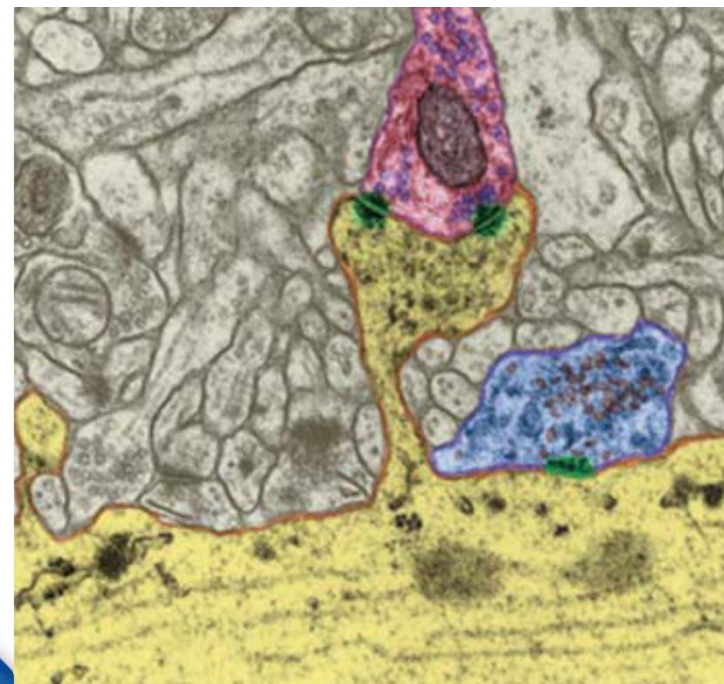
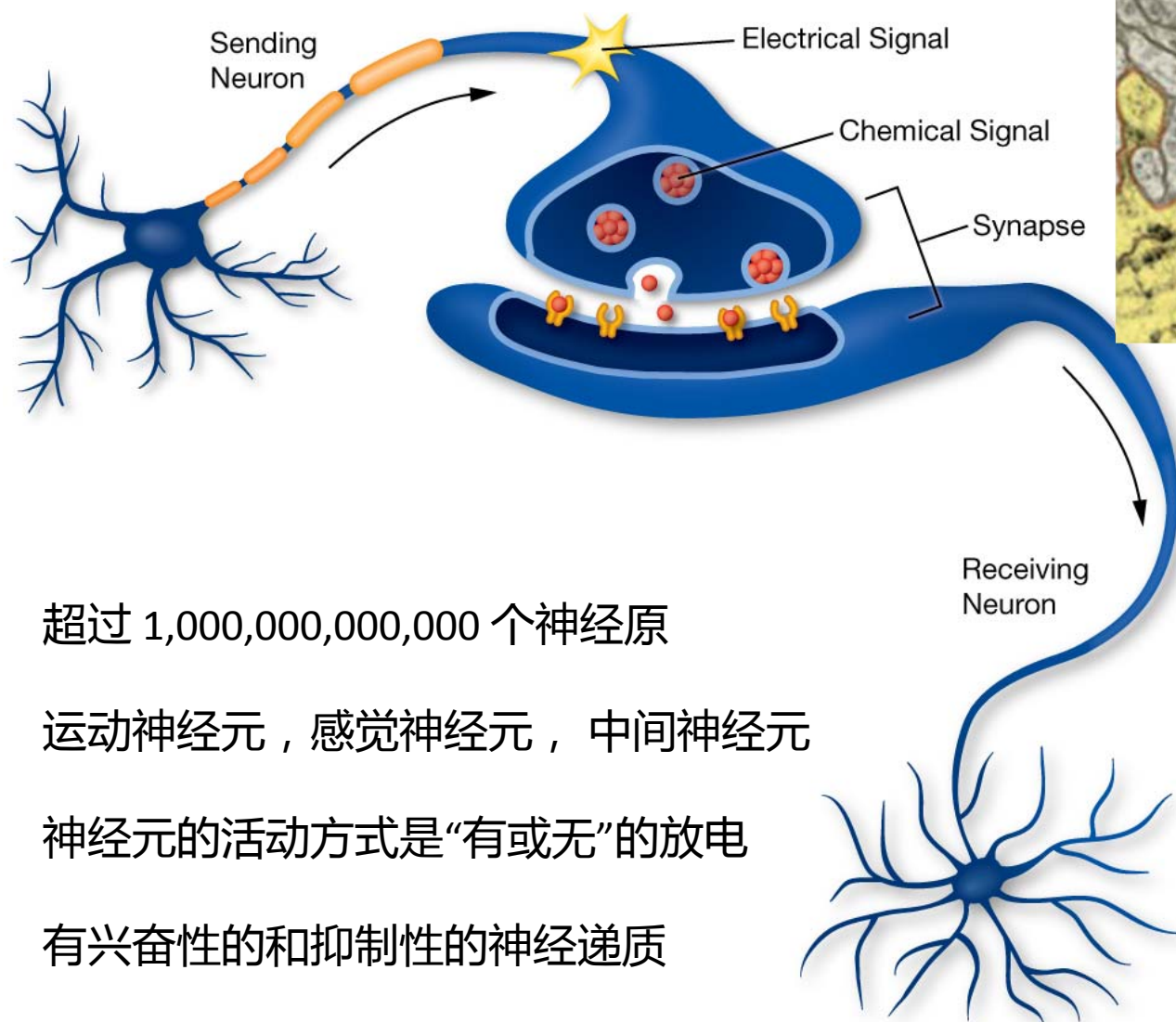
培养基中的神经元



体内的神经元



神经元的工作方式

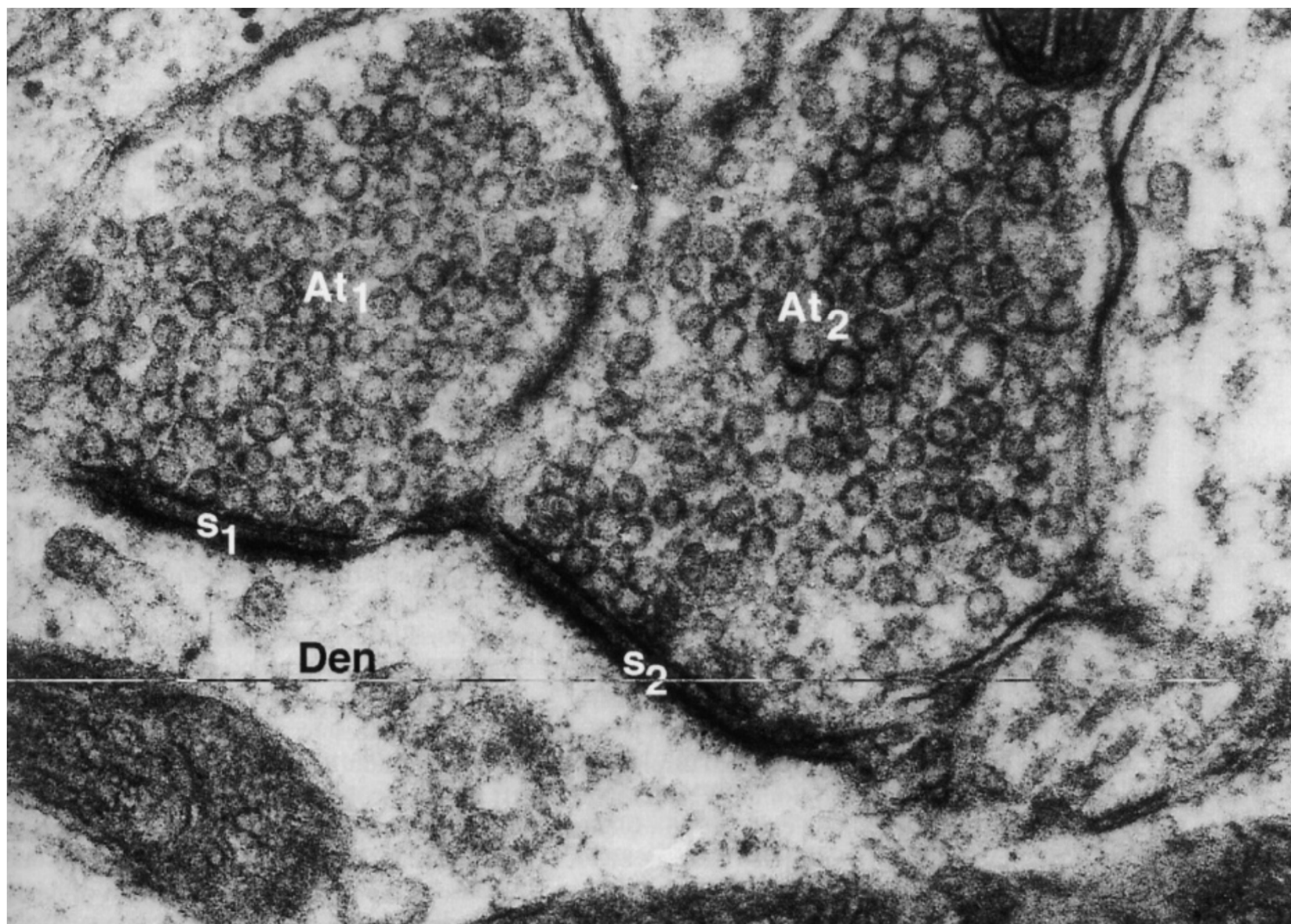


超过 1,000,000,000,000 个神经原

运动神经元，感觉神经元，中间神经元

神经元的活动方式是“有或无”的放电

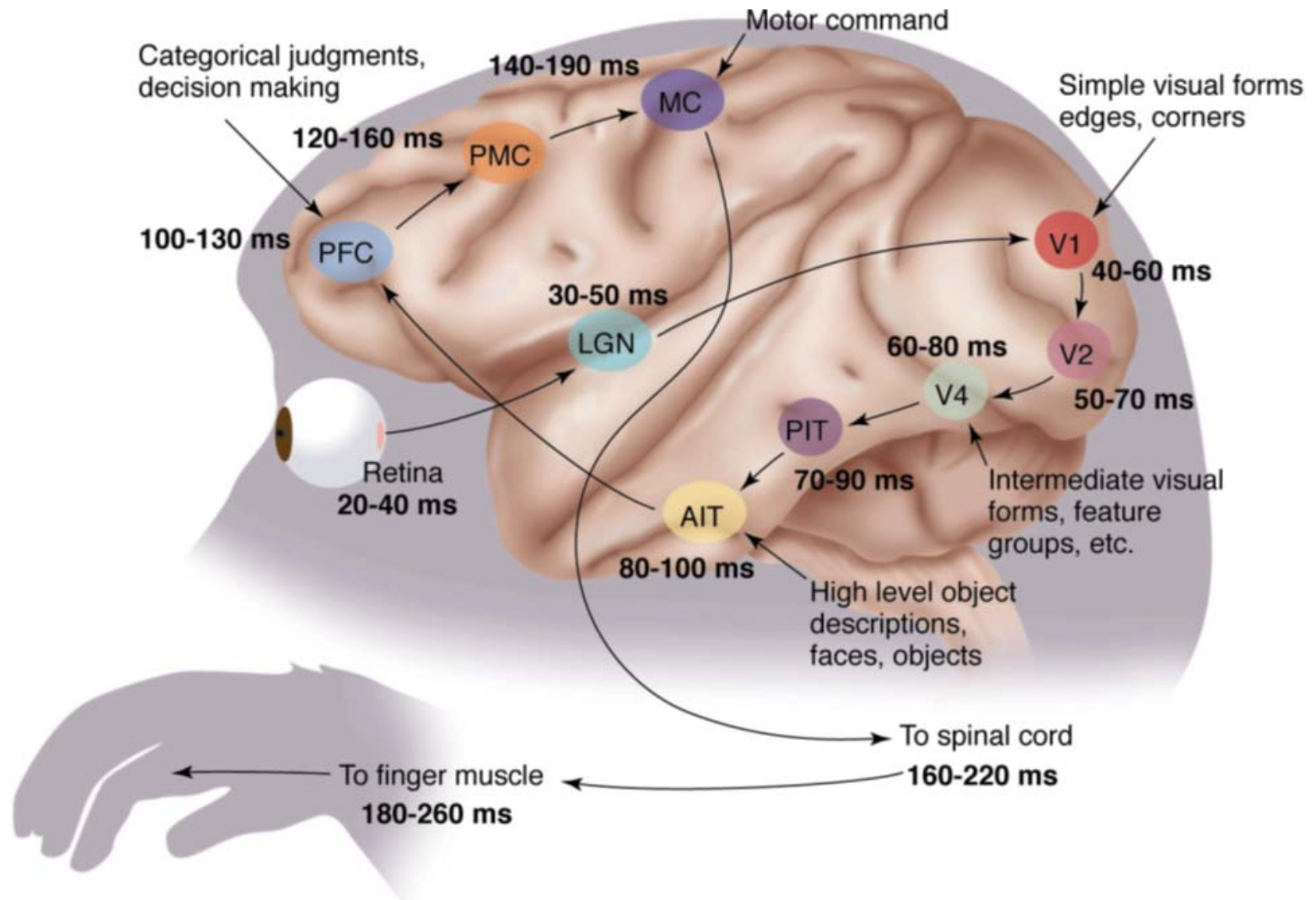
有兴奋性的和抑制性的神经递质

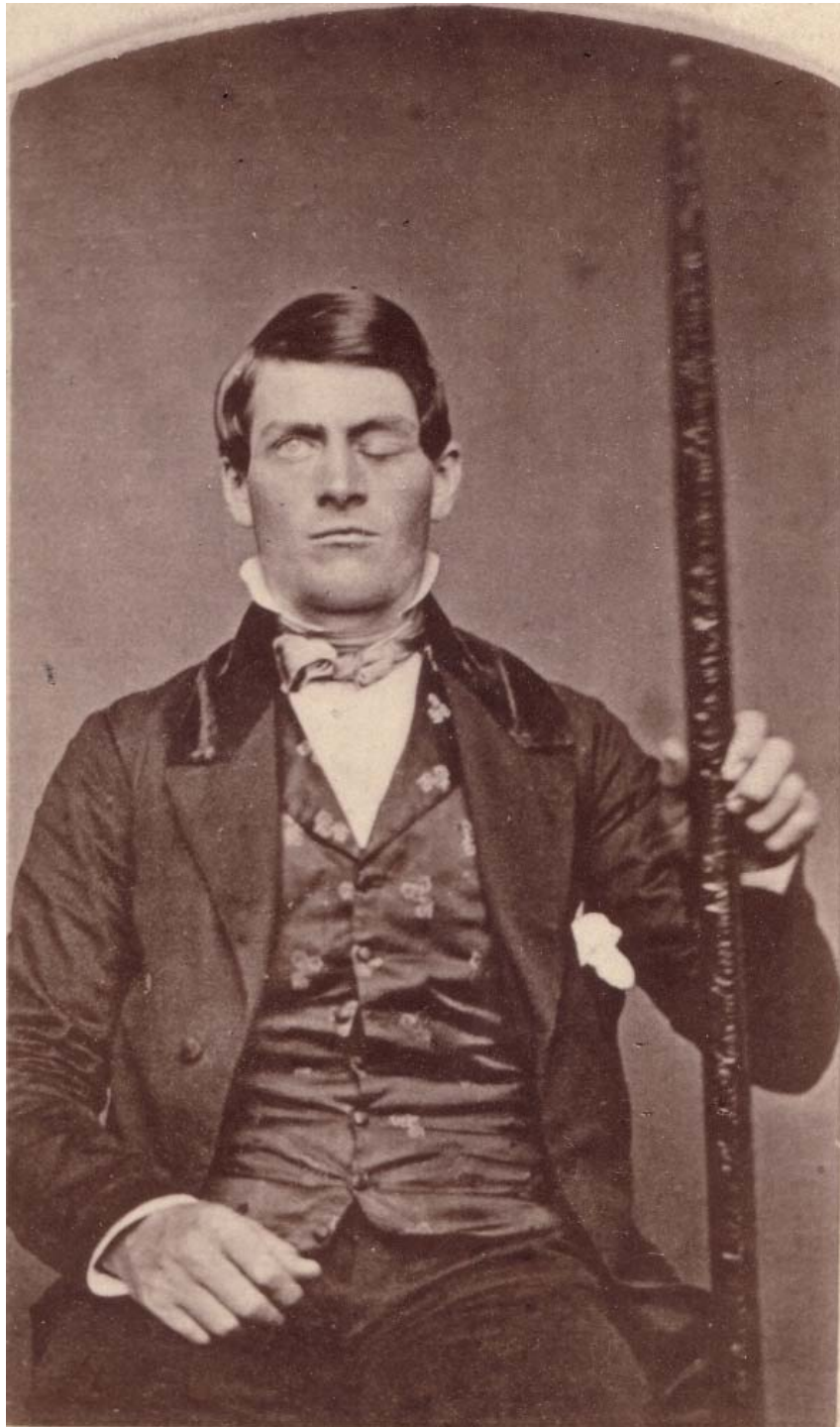


药物如何影响精神活动

- 兴奋剂 vs 拮抗剂
 - -- 箭毒
 - -- 酒精
 - -- 可乐，咖啡
 - -- 抗抑郁药, 如 Prozac
 - -- 帕金森药物：L-DOPA





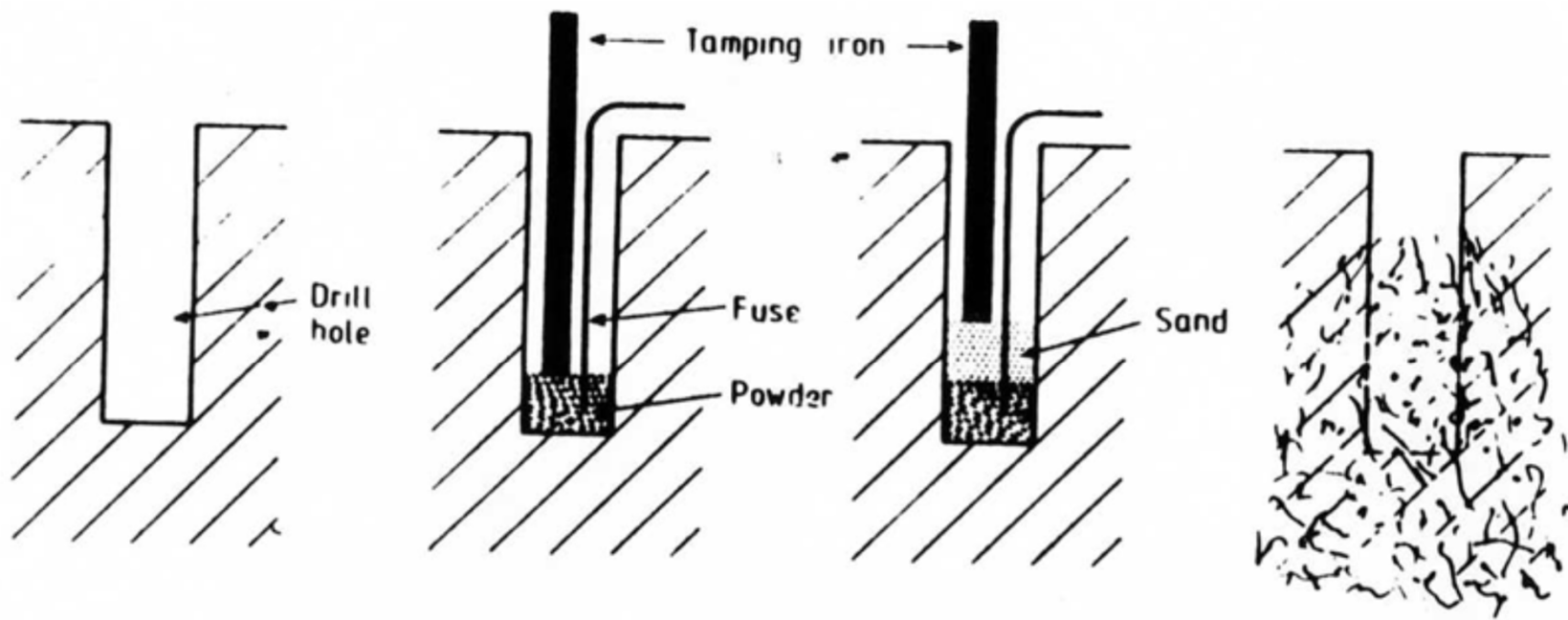


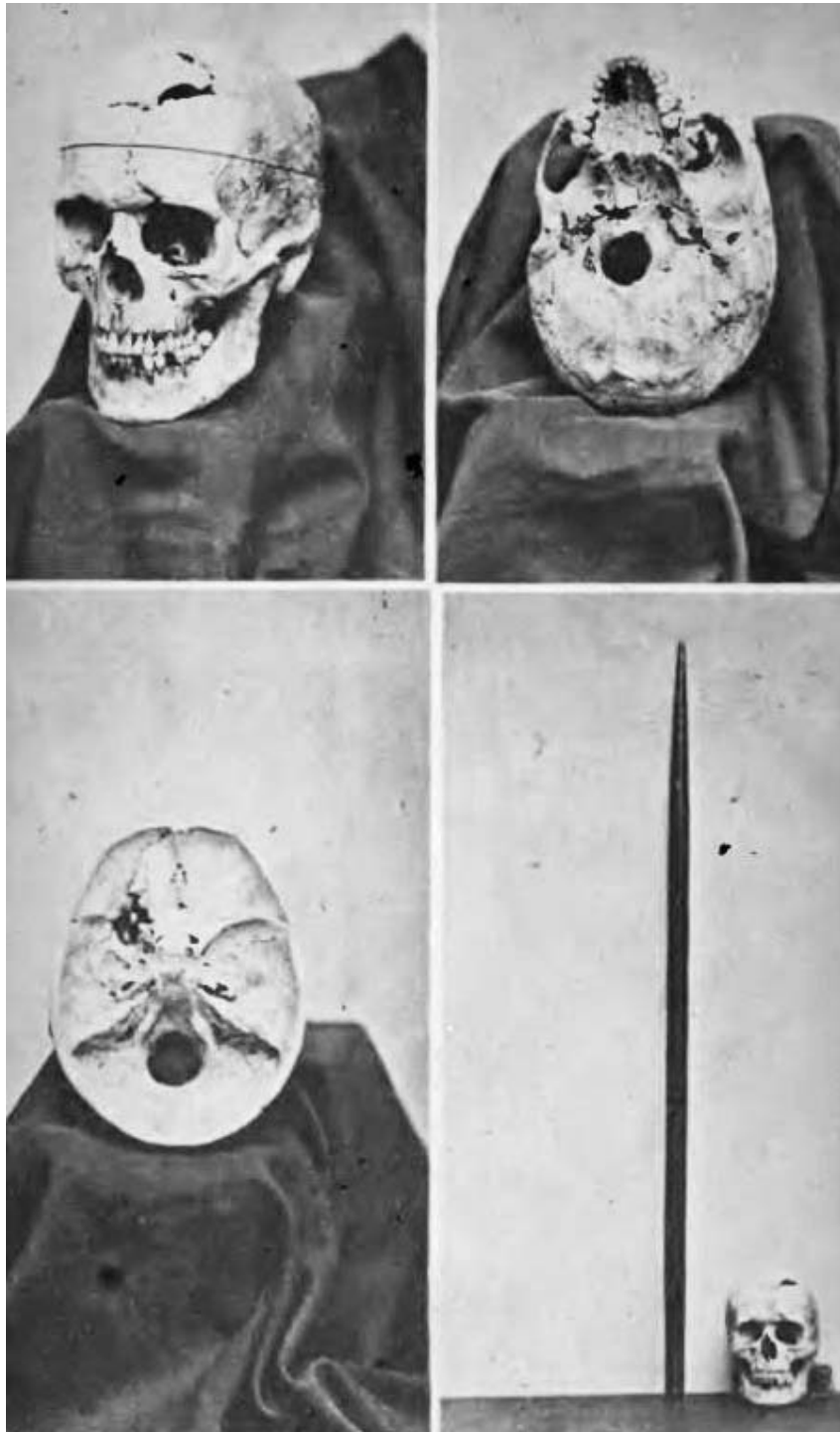
Phineas P. Gage (1823 –1860)

思维的物质基础

age 25 in 1848







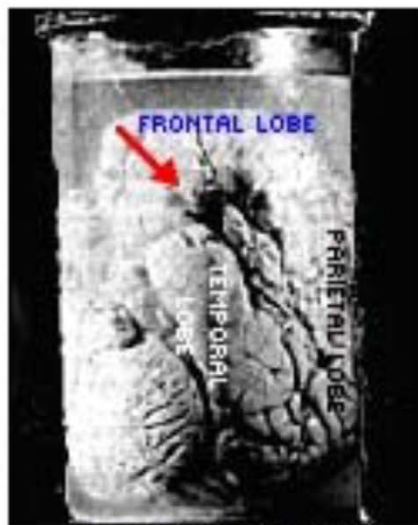
The mother and friends, ... placed this skull in my hands, for the benefit of science.

- **The equilibrium or balance, so to speak, between his intellectual faculties and his animal propensities, seems to have been destroyed. He is fitful, irreverent, indulging at times in the grossest profanity (which was not previously his custom), manifesting but little deference for his fellows, impatient of restraint or advice when it conflicts with his desires, at times pertinaciously obstinate, yet capricious and vacillating, devising many plans of future operations, which are no sooner arranged than they are abandoned in turn for others appearing more feasible. A child in his intellectual capacity and manifestations, he has the animal passions of a strong man. Previous to his injury, although untrained in the schools, he possessed a well-balanced mind and was looked upon by those who knew him as a shrewd, smart business man, very energetic and persistent in executing all his plans of operation. In this regard, his mind was radically changed, so decidedly that his friends and acquaintances said he was 'no longer Gage'."**

Paul Broca(1824-1880)



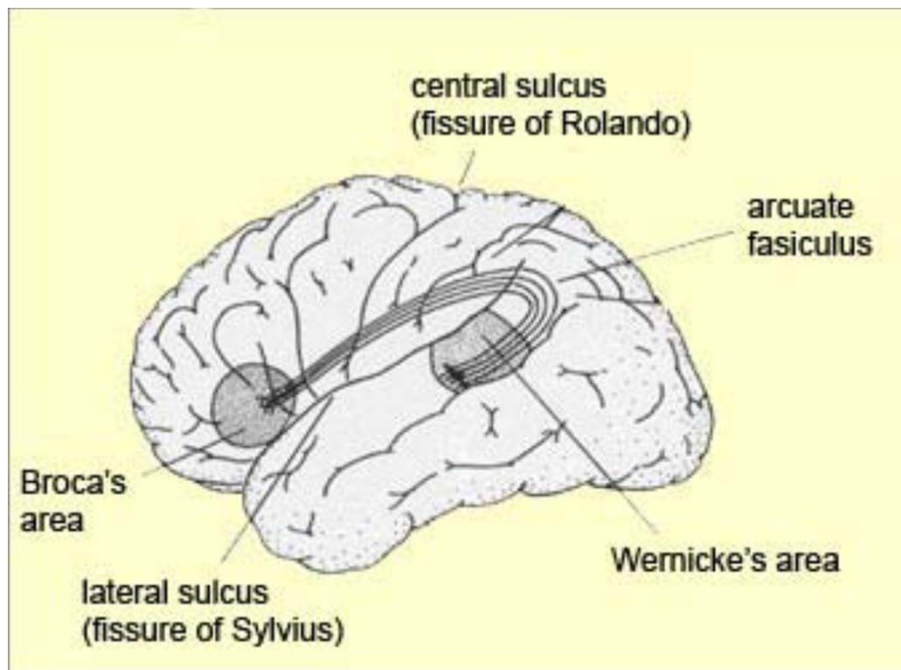
PAUL BROCA



THE BRAIN OF MR. 'TAN'



Broca失语症 Broca's aphasia



**results from damage to Broca's Area
(e.g., lesions)**

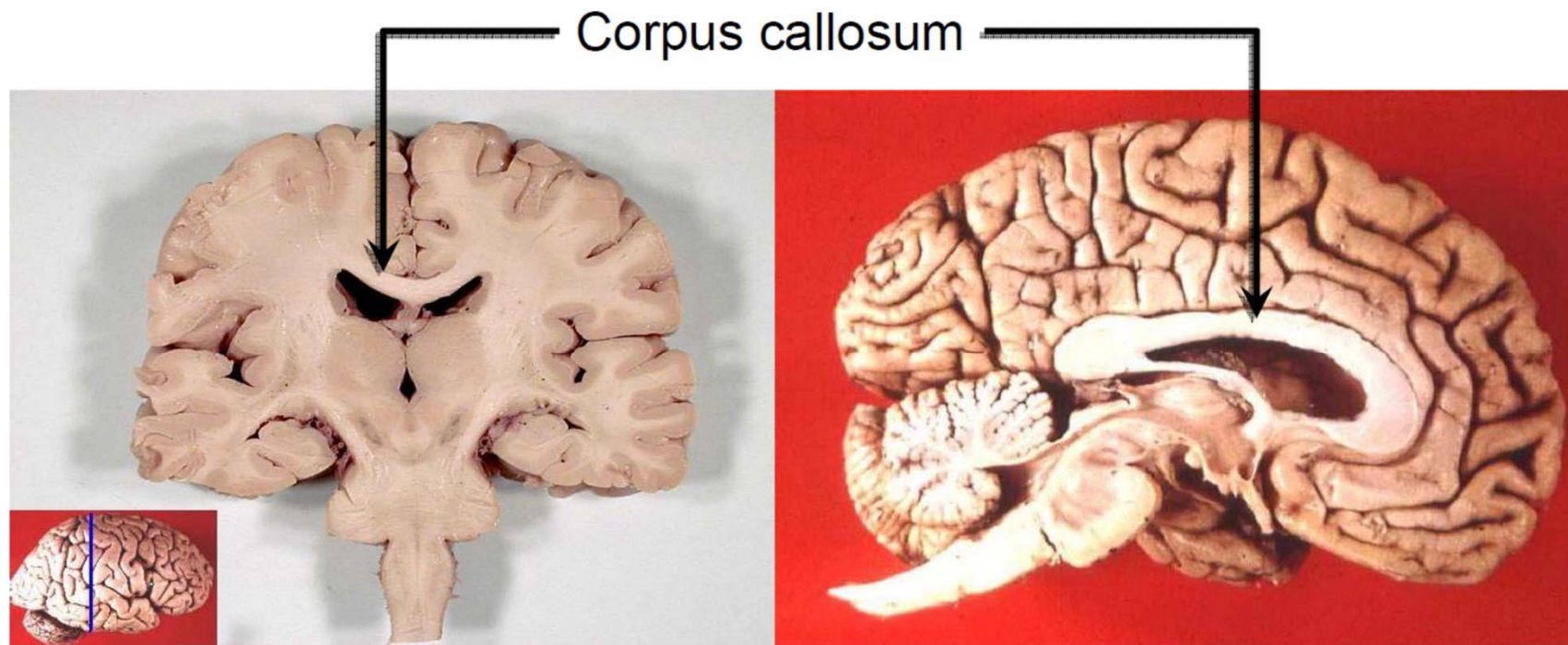
**unable to create grammatically-complex
sentences**

**speech described as telegraphic,
contains content words only**

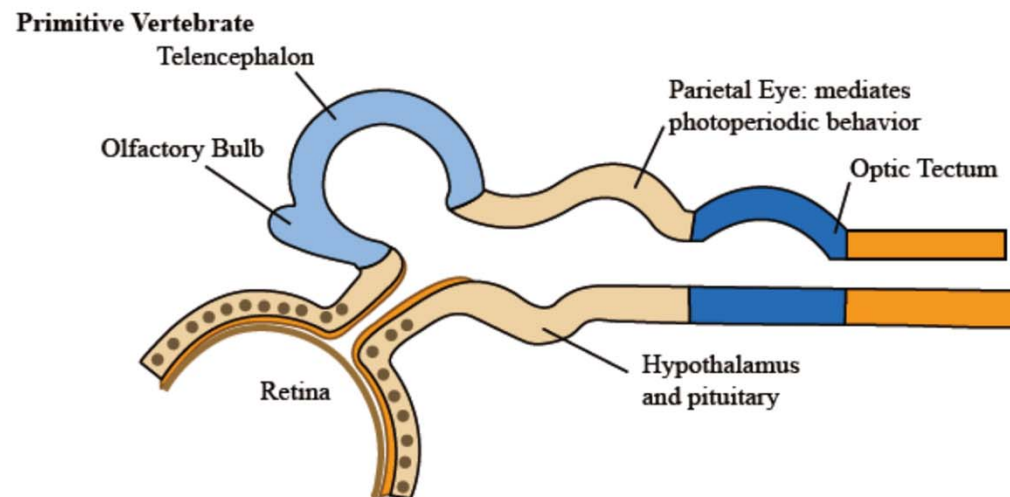
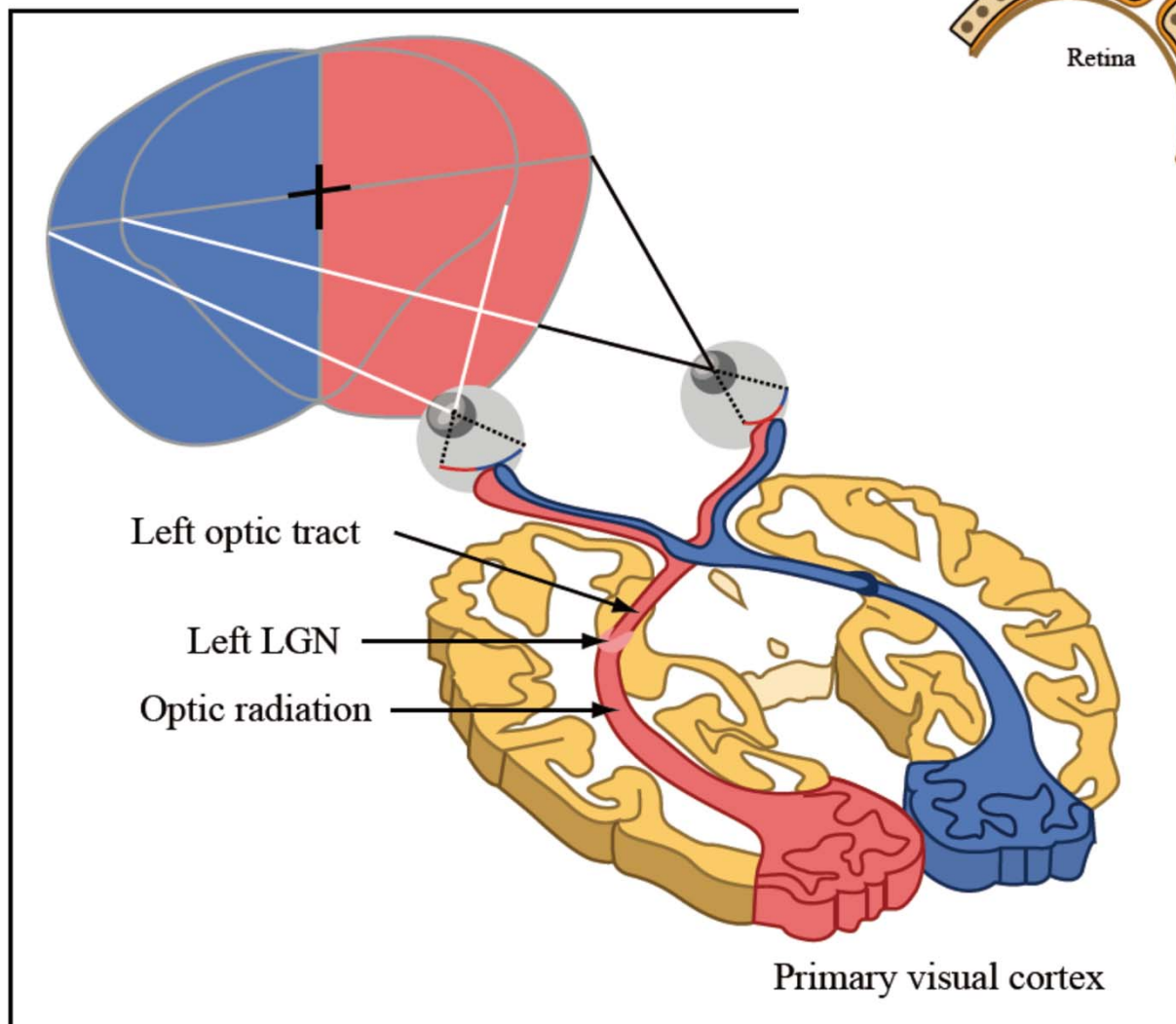
comprehension is relatively normal

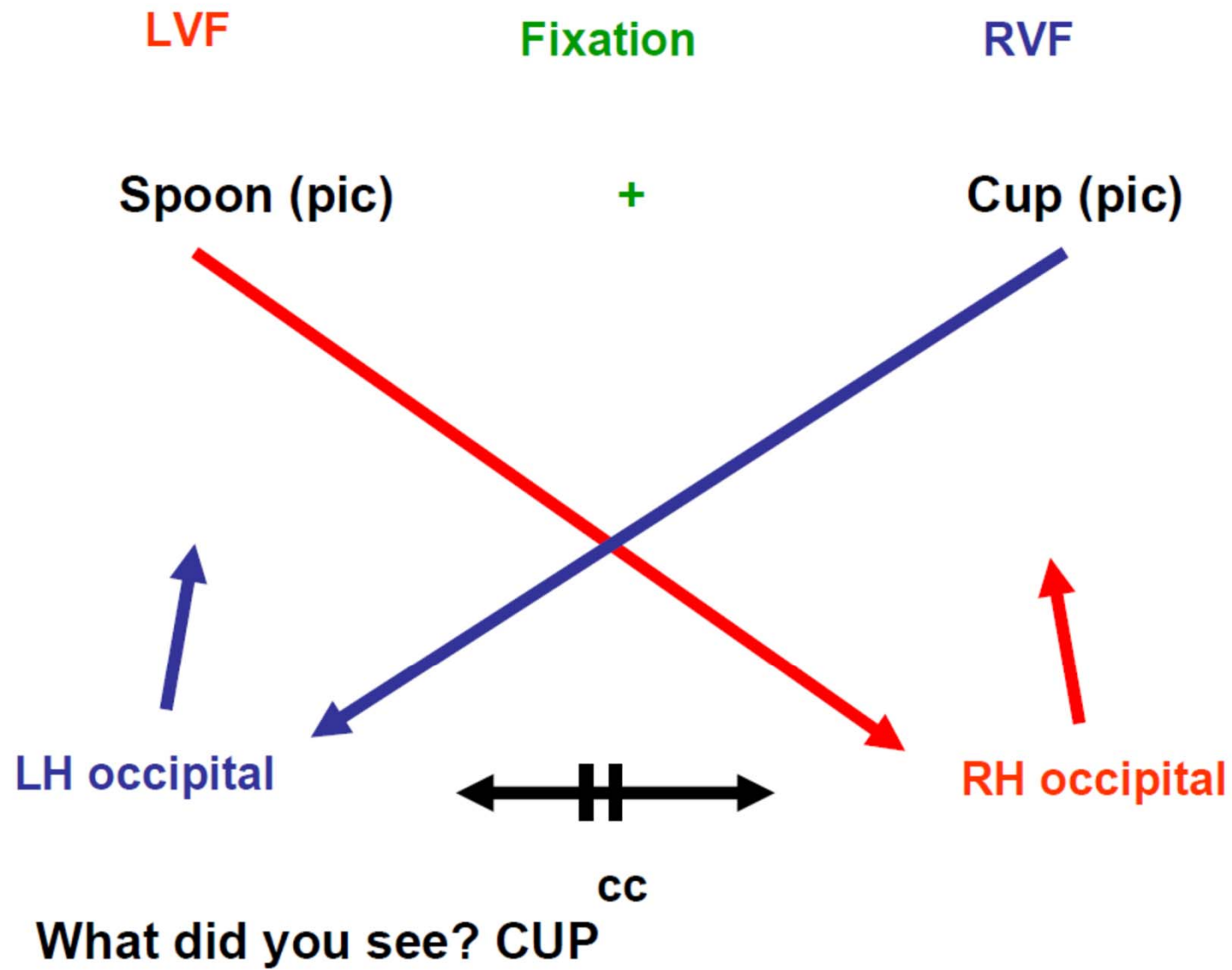
胼胝体

Corpus Callosum



视觉通路

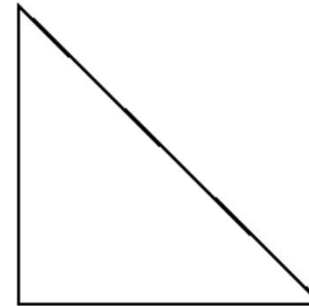




LVF

Mutual Unawareness

RVF



Draws Square

right hand



LH

left hand

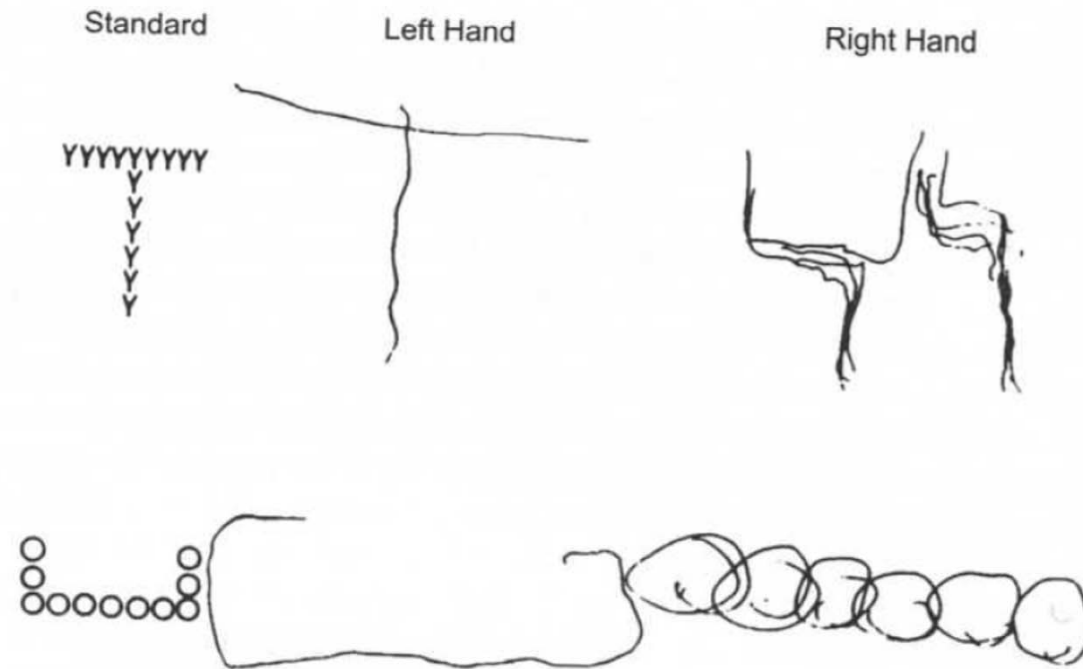


RH



What did you see? - Triangle

Split-Brain Patient After Surgery

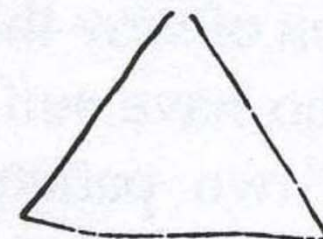
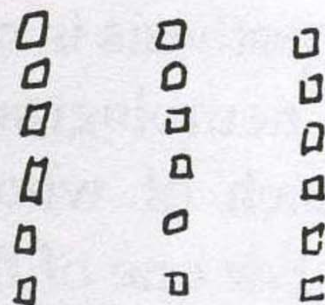
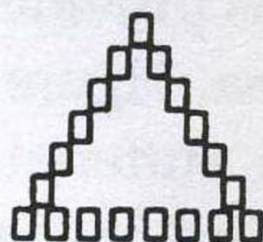
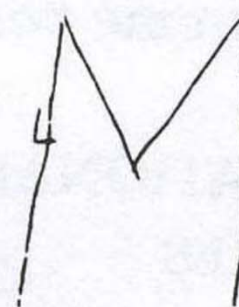
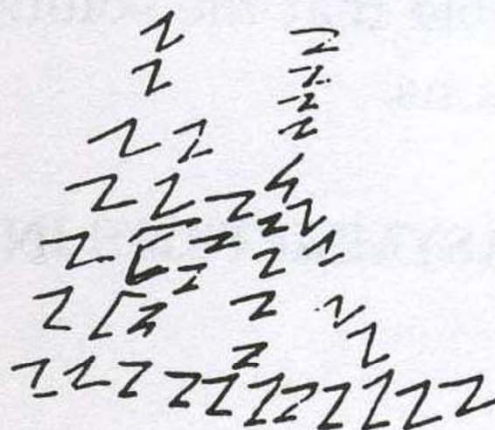
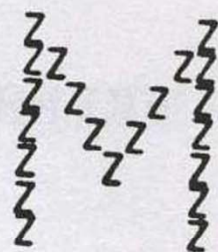


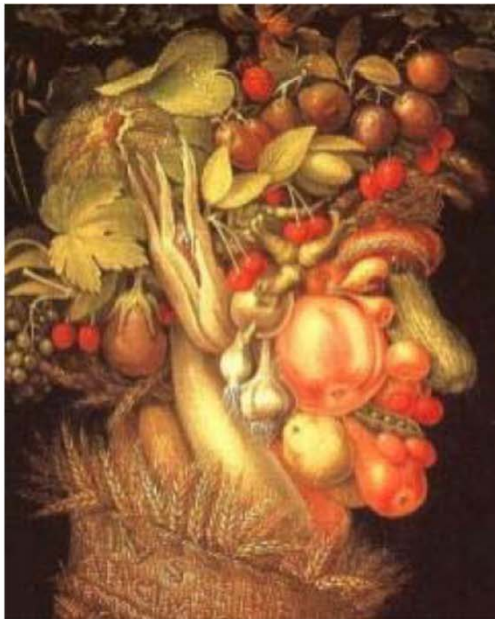
© source unknown. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <http://ocw.mit.edu/fairuse>.

Stimulus

Right Damage

Left Damage





These pictures are public domain.

Arcimboldo
1530-1593

END