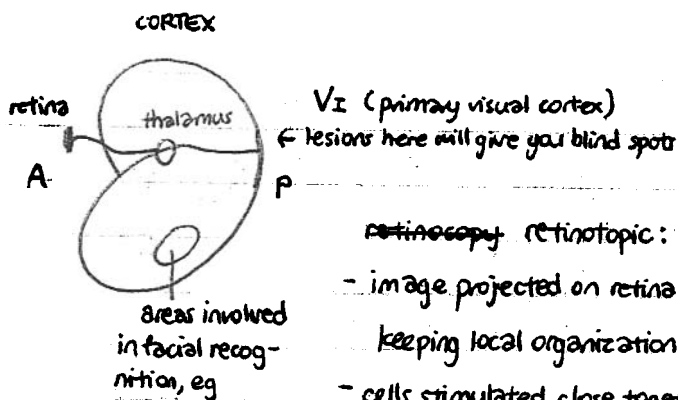


MIMI LEE'S NOTES.

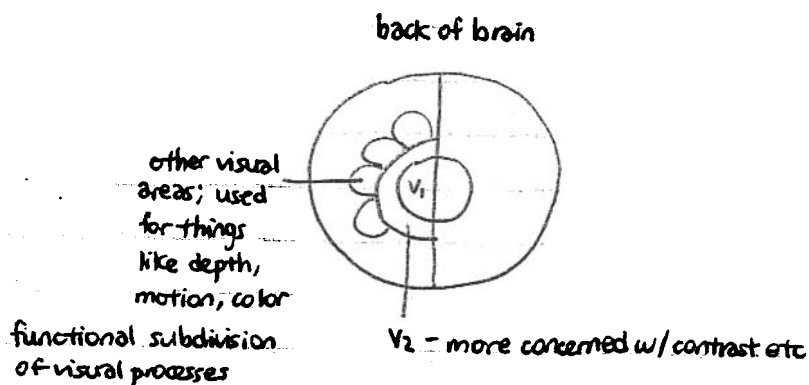
Cellular Neurobiology 7.29J

2/4/04



retinotopy: retinotopic:

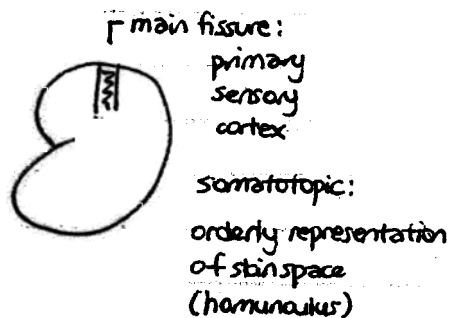
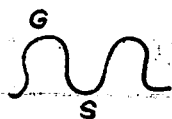
- image projected on retina upside-down, projected keeping local organization to V1
- cells stimulated close together on retina still stimulated close together in V1



- conservation of main fissures and wrinkles in brain

- sulci - valleys (big sulci = fissures)

- gyri - prominences

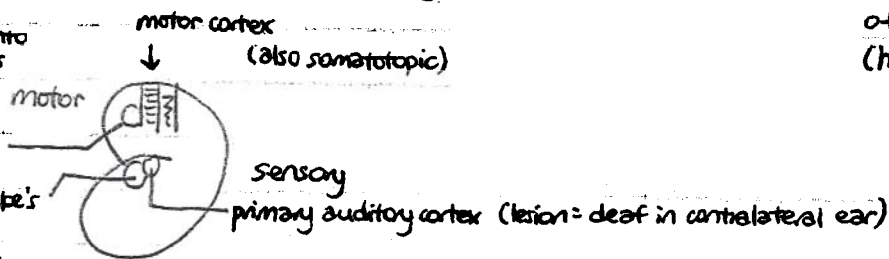


translates words into premotor patterns

Broca's oval (lesions = speak w/ difficulty)

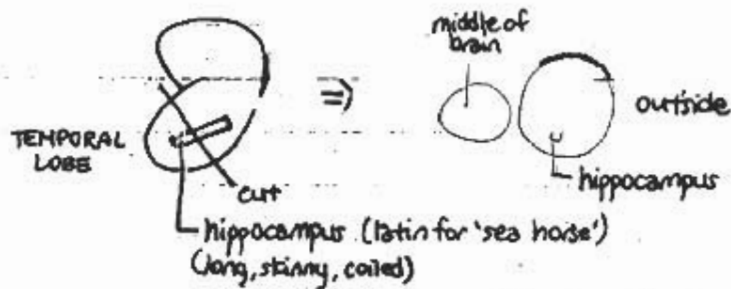
Wernicke's area

(lesions = unable to speak sense; no proper sentence structure) processing of words into speech



- sensory inputs sent to defined areas of cortex, often w/ topic organization

things not well understood about brain



- repetitive severe epileptic effects can destroy cortical function
- many regions of brain identified through looking for epileptic sites in conscious patients
 - also lesions in humans and animals, recordings from animals
- hippocampus contains many epileptic foci; can usually be removed w/ little impairment
 - Henry M.: foci on both sides, had bilateral hippocampal removal (and more)
 - now amnesiac; no long-term memory (can't make new memories)
 - intact memories to up to 2 years before his operation
 - can still gain new skills
- hippocampus crucial for formation of new higher-order memories
 - ischemic / vascular patients may have small hippocampal defect; slightly amnesiac

temporal lobe epilepsy - leads to constellation of character changes

- eg hypergraphia - compulsion to write
- latching onto moral implications of questions / issues (see things in hyper-moral terms)
- hyper-religiosity (zealots)
- hypersexual (but brief bouts of intense sexual involvement)
- "Worm schizophrenics"
- eg Fyodor Dostoyevsky, Vincent van Gogh, Tom Wolfe
- also hippocampal stimulation type

frontal lobe lesions - Phineas Gage, eg (prefrontal cortex)

- personality change (no longer responsible + meticulous: lewd, rude, crude)
- less severe frontal lesions: lose application of knowledge in practical way (reasoning ability?)
 - can't take learned information + organize into ordered acts

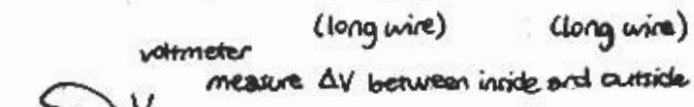
- human brain - ~ thousand billion cells, all specialized
- in nerve cord, some cells that have targets on other side
- correct wiring is not enough for proper brain function; development is complicated (wiring, then activity-dependent refinement)



need ligand + receptor for orderly targeting

Drosophila - ~ 300,000 neurons

knee-jerk reflex: stretch receptors → sensory neuron → motor neuron → muscle



$$V = IR$$

glass electrodes (~ 1 μm in diameter): fill w/ salt solution (usually AgCl)
 - glass = insulating outside (high R)
 salt solution - continuous w/ cell inside

- use oscilloscope instead of voltmeter

