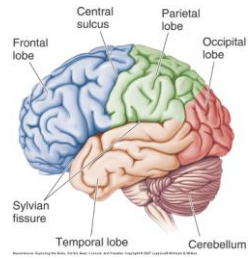
Slide 1

Bear,Connors, Paradiso
Neuroscience: Exploring the Brain
3rd edition

Chapter 1: Past Present Future

Slide 2

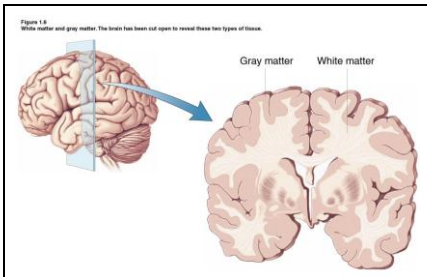


Same pattern in everyone

Why?

Gyrus, gyri; sulcus, sulci Deep sulci are fissures

Slide 3



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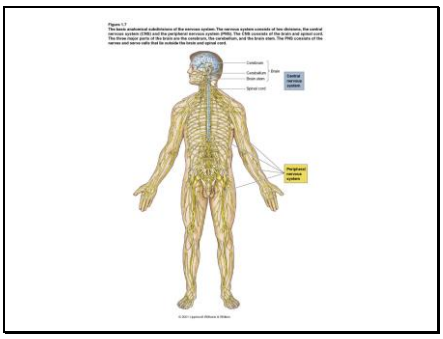

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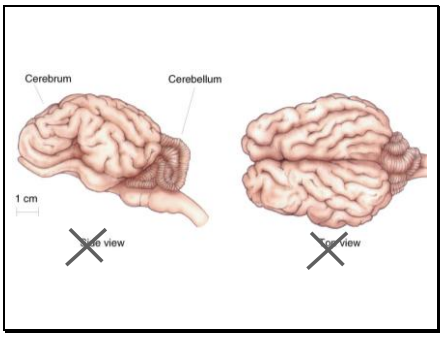

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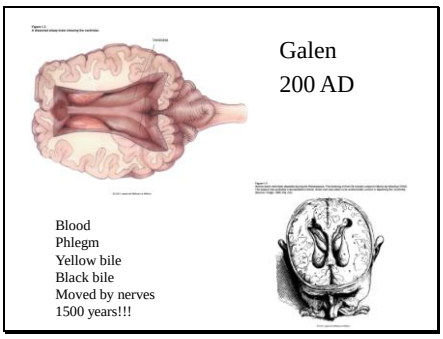

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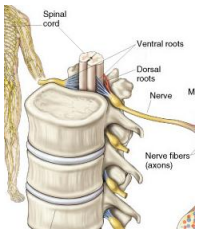
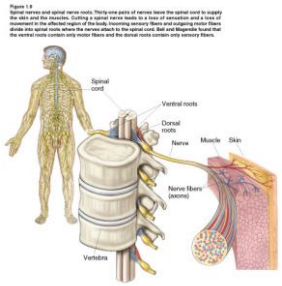


– Decartes 1600
Added "mind"

– Galvani 1790

Slide 8



VENTRAL motor efferent

DORSAL sensory afferent

Different directions

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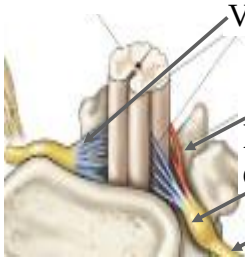
SAME

VENTRAL



DORSAL GANGLIA

nerve

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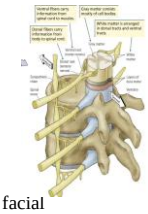
Francolis Magendie 1822
France

Charles Bell 1811
Scotland



Bell's palsy – motor portion of facial nerve (7th)

dorsal or ventral? Cranial nerves are different

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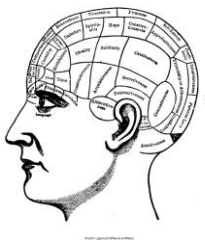
idiopathic

- trauma
- tumor
- meningitis
- herpes
- ear infection
- high blood pressure
- diabetes
- upper respiratory infection

Slide 12



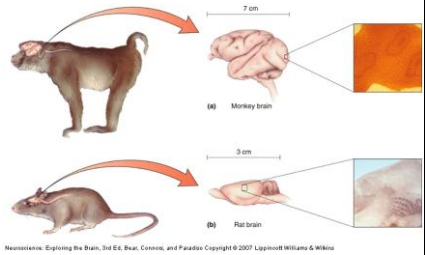
Gall 1820

vs Flourens

RELATIONSHIP
STRUCTURE/
FUNCTION

Broca - 1860

Slide 13



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darwin

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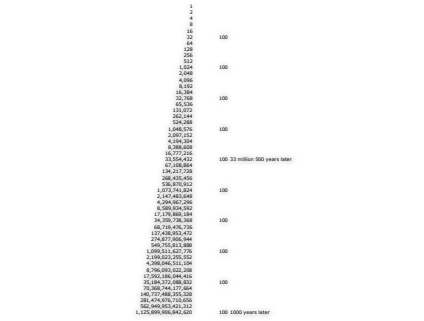


Slide 15

Why Animal Models?

structures/ events shared across species

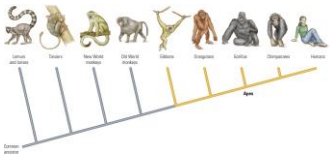
- less than 1% of the number used for food
- Experiments must advance knowledge
- Pain and distress minimized
- All alternatives exhausted first

Slide 16

all chordates have cerebrum and cerebellum

4000 species of mammals

Slide 17



brains get bigger,differences in scaling
- cortex
- limbic system

Slide 18

Who studies the brain?

Levels of analysis:
- Molecular
- Cellular
- Systems
- Behavioral

Slide 19

Table 1.3 **Some Major Disorders of the Nervous System**

DISORDER	DESCRIPTION
Alzheimer's disease	A progressive degenerative disease of the brain, characterized by dementia and always fatal
Cerebral palsy	A motor disorder caused by damage to the cerebrum at the time of birth
Depression	A serious disorder of mood, characterized by insomnia, loss of appetite, and feelings of dejection
Epilepsy	A condition characterized by periodic disturbances of brain electrical activity that can lead to seizures, loss of consciousness, and sensory disturbances
Multiple sclerosis	A progressive disease that affects nerve conduction, characterized by episodes of weakness, lack of coordination, and speech disturbance
Parkinson's disease	A progressive disease of the brain that leads to difficulty in initiating voluntary movement
Schizophrenia	A severe psychotic illness characterized by delusions, hallucinations, and bizarre behavior
Spinal paralysis	A loss of feeling and movement caused by traumatic damage to the spinal cord
Stroke	A loss of brain function caused by disruption of the blood supply, usually leading to permanent sensory, motor, or cognitive deficit

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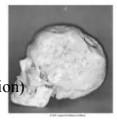
ANNUAL – USA ALONE



Alzheimer's disease (5.1 million; 172 billion)

Parkinson's disease (1.5 million, 25 billion

Depression (10-19%; 44 billion)

Schizophrenia (3 million) (Cost 62.7 billion/year)

Stroke (4 million) (Cost $43 billion/year)

Addiction – ?? (Cost $200 billion / year???)

Slide 21

- 1. *Observation and question*
  WHY???
- 2. *Hypothesis* make a prediction
  – IF….THEN (MUST be testable)
- 3. *Designing an Experiment*
  - test a hypothesis.

******All good experiments have controls

- 4. *Data Interpretation*
  - "What do these results mean?".
- 5. *Conclusions* - inference
  – The data suggest…..