Emotion
General and historical

• Darwin - Expression of emotion in man and animals -

• 1872James-Lange theory: physiological changes - > emotional experience "we are afraid because we tremble" counterintuitive

• Cannon-Bard theory: emotional experience is primary (Cannon coined "fight or flight") (and, of course, it is the sympathetic nervous system that prepares the body for both)
Hypothalamus

- Bard did cortex inhibits hypothalamic (sham-directed at everything) rage unless the caudal hypothalamus is also disrupted.
- Hypothalamus -> reticular formation for rage
- Walter Hess (1949 Nobel prize) - rage or fear if hypothalamus stimulated.
- shared w/ Moniz, developed frontal lobotomy
- Electrical self-stimulation Olds & Milner - of hypothalamus is positive reinforcement in operant conditioning paradigm in a Skinner box
Hypothalamus

- ventromedial nucleus lesions makes a fat rat,
- older literature called this a satiety center,
- lateral hypothalamus lesions: thin rat, so LH
- was once called a hunger center.
- problems with calling a small lesioned area a such-and-such-center based on the defect.
- Also, LH is where medial forebrain (reward) system goes (dopamine, covered repeatedly already).
(B) Facial motor paresis

Voluntary smile

Response to humor

Emotional motor paresis
**VOLITIONAL MOVEMENT**

Descending "pyramidal" and "extrapyramidal" projections from motor cortex and brainstem

**NEURAL SYSTEMS FOR EMOTIONAL EXPRESSION**

Descending "extrapyramidal" projections from medial forebrain and hypothalamus

Voluntary facial paresis

Pyramidal smile

Motor neuron pools in facial nucleus

Activation of facial muscles

Emotional facial paresis

Duchenne smile
Facial expressions

- voluntary facial paresis inability to voluntarily move lower facial muscles on one side due to lesion [pyramidal smile]
- Duchenne (1862) cannot will certain spontaneous smiles
- Inability is over-riden (symmetrical) in involuntary movement ["Duchenne smile"]
- hypothalamus and amygdala feed to reticular formation and hence to motor neurons.
- Duchenne "faradization"
Corpus callosum
Cingulate gyrus
Fornix
Cut edge of midbrain
Parahippocampal gyrus
Temporal lobe
Limbic system

• Broca (1879)- limbic = "border"
• Papez (1937) circuit
• sheep brain dissection, fornix and mammillo-thalamic tract
• rabies affects hippocampus - exxagerated fear etc.
• tumors in cingulate cortex - fear & other emotions
• Also smell and memory
(C)

Orbital and medial prefrontal cortex

Amygdala (basal-lateral nuclei)

Ventral basal ganglia

Mediodorsal nucleus of the thalamus
Stories

- Amygdala lesions - fearlessness, difficulty recognizing emotions
- Stimulation - fear and violence
- Kluver-Bucy hostile monkey becomes docile
- Hypersexuality, mouthing objects, etc.
- Patient SM has degeneration of amygdala - cannot recognize or draw fear
- Urbach-Wiethe disease (autosomal recessive)
story

- Phineas Gage -
- spike through brain
- then acted oddly
- Duh
- Aprosody - inability to express emotion (like with monotone) with suprasylvian parietal cortex (on right side)
Affective disorders

• Lincoln "I am now the most miserable man living...I must die or be better, it appears to me,"
• Depression 10 % of people.
• fluoxetine (Prozac) [serotonin uptake inhibitor]
• like "soma" Aldous Huxley "Brave New World"
• Late 1980's, now one of the most prescribed drugs.
• sertraline (Zoloft) and paroxetine (Paxil)
• Depression more common in females