Everything discussed so far in the course is a product of the human mind.

The brain represents a scientific problem of unprecedented complexity.

The mind is that which makes us human?

Unit 6: Mind

a. action of thinking, or occurrence of a thought;
b. the organ of the human brain.

(1) Is it possible to understand the human mind and brain?
(2) Science, power, and control.
Today: The role of the brain, ancients to Darwin

- 11/29: Madness
- 12/01: Psychology
- 12/06: Control
- 12/08: Finale
How can we learn what ancient people thought about the brain?
Human Ancestors

Evidence of Weapon Inflicted Skull Fractures

Photo courtesy of missmareck on Flickr.
Trephination

Photo courtesy of NeuroWoah on Flickr.

Photo courtesy of akseabird on Flickr.
Edwin Smith Papyrus, c. 2700/1650 BCE
48 case reports, including head injuries
The Book of the Dead
Weighing the Heart
Pre-Socratics and the Elements

Alcmaeon and Anaxagoras: brain is organ of mind
“Men ought to know that from nothing else but the brain come joys, delights, laughter and sports, and sorrows, griefs, despondency, and lamentations. And by this, in an especial manner, we acquire wisdom and knowledge, and see and hear and know what are foul and what are fair, what are bad and what are good, what are sweet, and what are unsavory. … And by the same organ we become mad and delirious, and fears and terrors assail us. … All these things we endure from the brain, when it is not healthy. … In these ways I am of the opinion that the brain exercises the greatest power in man. This is the interpreter to us of those things which emanate from the air, when the brain happens to be in a sound state.” On the Sacred Disease

Hippocrates, on the Brain
Humoral Medicine

- **Hot**: Air / Blood / Spring / Child
- **Dry**: Earth / Black Bile / Fall / Adult
- **Wet**: Water / Phlegm / Winter / Old
- **Cold**: Fire / Choler / Summer / Youth
Alexandria:

Herophilus (330-260 BCE)
Erasistratus (330-255 BCE)

Dissection And Vivisection
Plato, on the Soul

- Nutritive: liver
- Sensitive: heart
- Rational: brain
Aristotle

Heart as the source of heat and life, and seat of intellect

Brain as a radiator to cool the blood

Photo courtesy of davidjthomas on Flickr.
Galen of Pergamon (c. 129-217)

Experimental studies of nerves and spinal cord

Brain controls functions
Early Christian Writers: Brain’s Ventricles as the Site of Cognition
Arabic Science: Expanding the Greco-Roman Legacy
e.g., optics and vision
Andreas Vesalius

De Humani Corporis Fabrica, 1543
Heart as center -- or just a pump?
“this lax pith or marrow in man’s head shows no more capacity for thought than a cake of suet or bowl of curds.”

-- Henry More, c. 1660
Thomas Willis

*Two Discourses Concerning the Soul of Brutes*, 1683

“an account of the workings of the human soul as a compound of a rational, immaterial substance nested within a swarm of chemical spirits traveling along pathways through the brain into the nerves”
A very Tall and well Set Gentleman, Aged about 24 years, by a Fall from his Horse, had his Skull broken in several places, and being a Person of good Estate, had several Chirugeons to attend him in the course of his Sickness, during which he was divers times Trepan’d, and had several pieces of Skull taken off, which left great Chasms... between the remaining parts. Within about three days after his Fall, this Knight... was taken with a Dead Palsy on his Right side, which did not equally affect his Arm and his Leg; The use of the latter being sometimes suddenly Restor’d to him in some measure. ... But his Arm and Head were constantly Paralytical, being wholly depriv’d of Motion; and having so little Sense, that it would sometimes lye under his Body without his Feeling it. ... And when the Chirugeons were going to close up his Head, as having no more to do; one of them... (alleged) that, if they did no more, the Gentelman would lead a Useless and very Melancholy Life; and that he was confident, the Palsey was in some way or other occasion’d by the Fall, which had left something in the Head that they had not yet discover’d. And the Knight himself agreeing to this Man’s notion, his Head was further laid open; and at length, under a piece of proud Flesh, they found, with much ado, a Splinter, or rather Flake of Bone, that bore hard upon the dura matter, and was not pull’d out without great Hemorrhage, and at such a stretch of the Parts, as made the Patient think his Brain itself was tearing out. But this Mischief was soon Remedy’d, and his Hurts securely Heal’d up; and he is now a Strong Healthy Man. (1691, 67–73)
Rene Descartes: Mechanical Universe?

Photo courtesy of George M. Groutas on Flickr.
Life as Reflex Action?
The Pineal Gland and the Rational Soul
Mechanisms of Pineal Control

Pivot to open/close valves to control flow of animal spirits
OBSERVATIONS
ON
MAN,
HIS
FRAME,
HIS
DUTY,
AND HIS
EXPECTATIONS.

In Two Parts.

By David Hartley, M.A.

London,
Printed by S. Richardson,
For James Leake and Wm. Frederick,
Bookellers in Bath;
And sold by Charles Hitch and Stephen Austen,
Bookellers in London.

M.DCC.XLIX
“Suddenly I received in my right hand a shock of such violence that my whole body was shaken as by a lightning stroke. The vessel, although of glass, was not broken, nor was the hand displaced by the commotion: but the arm and body were affected in a manner more terrible than I can express. In a word, I believed that I was done for.”

-- Pieter van Musschenbroek
What Is the Relation of Human and Animal?

Reason

Emotion

Passion
“the indelible stamp of his lowly origin”
The Rise of Modern Science

Final Paper Proposal

Due Date: Monday, 22 November 2010. In class or via email to your TA.
Length: 1-2 double-spaced pages. You should use standard margins (1-inch to 1.25-inches on each side of the page), and a 12-point font.
Grade: Your grade on the final paper proposal will contribute 5% of your final course grade.

Your final paper for STS.003 will be due in December. To help you prepare for that project, you will hand in a brief proposal, due to your TA in class or via email not later than 1pm on Monday, 22 November 2010.

For the final paper assignment, you will choose one of three topics:

Option A, “Eclipse and emergence,” involving Arthur Eddington’s eclipse expedition to test Albert Einstein’s general theory of relativity;
Option B, “In the flesh,” involving Gunther von Hagens’s controversial exhibition, Body Worlds;
Option C, Choose and research your own topic.