

Chapters 2 & 3
Philosophy and Physiology:
Foundations of the Modern Psychology

Typical Order of events....

1. Demonstration (not often)
2. Student Article Summary Presentation(s)
3. Individual Sections ("Zeitgeist"/Discussion/Lecture)

Chapter 2
Key idea in 1st Section
"Machines"

*Machines developing at fast rate
*Spurred key concepts in science:
Mechanism
Determinism
Reductionism



Automated musicians play along with clock
Source: www.thebritishclockmaker.com

The Glockenspiel in Munich





Two automata who performed with others on large clock.

From: www.thebritishclockmaker.com



German soldiers on Clock: Play 8 songs

The Glockenspiel in New Ulm, MN
(credit: New Ulm Telecom, www.newulmtel.net)



<https://youtu.be/zY4ipOrbaqY>
<https://www.youtube.com/watch?v=2KOMB3htVQ>

Machines of the 17th & 18th Centuries:

- * Automata
- * Calculating Machines (Babbage)
- * Farming and Factory Machines
- * Many More.....(the crapping duck?)

Machines acted like humans, thought like humans, and did the work of humans.

Any similar machines/devices/models today?

Scientific Principles Applied to Human Nature

Mechanism

We operate like machinery -- our actions and thoughts can be explained by principles from the Natural Sciences

Determinism

Every thought and action has an immediate cause (or series of causes)

Reductionism

We can understand humans by breaking things down to simpler components

End of pt. 1

I. Rene Descartes: French, worked in 1600's

A. Mind-Body problem: What is the connection/relation between mental and physical?
Conventional view was → mind controls body

B. Reflex-Action: Stimulus-response reflex.
Involuntary actions without mental control

C. Mind-Body Interaction: Body can also impact/influence the mind.
Spirits/Fluids move through nervous system to brain, resulting in sensations (mind).

D. Innate and Derived Ideas: Some ideas are innate (universal), others are derived through experience

End of pt. 2

II. August Comte: French, worked in 1800's

A. Positivism: All knowledge must rely on objective, observable, and undeniably true facts. Physical sciences had achieved this standard, all philosophers should adopt Positivism

Positivism became a popular Zeitgeist, particularly in France.

B. Materialism was a related philosophy. All human functioning should be understood in terms of matter and energy. (anatomy and physiology)

III. John Locke: British, worked in late 1600's

A. Empiricism: Mind is "Blank Slate" and all knowledge is derived from experience.

B. Sensation (sensory experience) and Reflection (mind's understanding)

C. Simple and Complex ideas.

D. Association of Simple ideas form Complex Ideas

E. Primary and Secondary Qualities
Primary exist in object (e.g., size and shape)
Secondary depend on one's perception (color, odor, temperature, etc.).

End of pt. 3

III. George Berkeley: British(Irish), 1700's

"Perception is reality"

A. Credited with Mentalism: All knowledge is a function of the experiencing person.

B. Association: Knowledge is based on an association of Sensations (the Coach example)

Another British Philosopher relying on association and empiricism

IV. David Hartley: British, worked in 1700's

The key elements of Association are:

- * Contiguity ("closeness" in time/space)
- * Repetition (frequency of co-occurrence)

V. James Mill: British(Scot), worked in 1800's

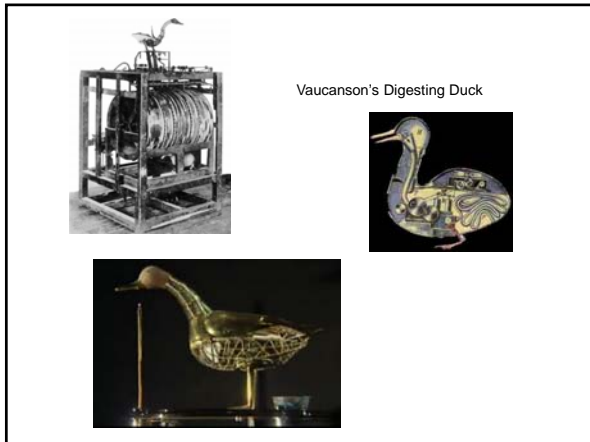
Mind as Machine – Mechanist to the Extreme
Experience leads to sensations which are associated into higher-level ideas. An automatic, mechanical process.

VI. John Stuart Mill: British, worked in 1800's

Used Chemistry, rather than Physics, as his model

Rejected strict mechanical view (& his Father)
"Creative Synthesis" – simple ideas can be combined into complex ideas that are unique and more than sum of parts. Complex ideas have distinct qualities not observed in the simple ideas

End of pt. 4



Chapter 3: Physiological Influences on Psychology

Human Errors in Astronomy: A little subjectivity

I. Early Brain Research
(Recall research on Anatomy from Descarte's time)

Extirpation: Lesion or damage part of brain to see its impact on behavior

Clinical Method: After death, examine brains of people who had displayed unusual behaviors

Electrical Stimulation: Stimulate brain with weak electric impulses and observe impact on behavior.

II. Brain Assessment from the "Outside"??

Franz Josef Gall – the size and shape of the brain might be related to size/shape of skull

Cranioscopy or Phrenology: Shape of Skull reflects intellectual or emotional characteristics.
(See Fig. 3.1)

Others demonstrated that there was no link between internal brain and shape of external skull.

III. Nervous System: Electric impulses

End of pt. 5

IV. Beginnings of Experimental Psychology

Germany proved to be an excellent location:

- Experimental Approach to Science that was Broad
- University system encouraged flexible, unique curriculum
- German kingdoms competed to have best Universities
- England, U.S., etc. had few Universities.

V. Three important German Scholars/Researchers in the 1800's set the stage for Psychology....

A. Hermann von Helmholtz

Studied color vision, hearing, visual perception, etc.

**Findings in Nerve Physiology: neural impulses are approximately 90 feet per second as demonstrated in numerous experiments.

End of pt. 6

B. Ernst Weber – studied perception

*Two-point Threshold

*Just Noticeable Difference (JND) were a constant ratio (e.g., 1:40 with standard weights)

Both Helmholtz and Weber provided methods that would aid future Psychologists

C. Gustav Fechner – Also studied perception

* Absolute Threshold: point distinguishing when stimulus is perceived vs. not perceived

* Differential Threshold: least amount of change in stimulus that changes sensation

Formalized **Psychophysics (mental & material)**

Quantitative relation between physical st
psychological response: **S = c log R**
(S is Sensation and
R is the Intensity of the Stimulus)

