I. Rationalism & Empiricism

Epistemological positions

(A) **Rationalism**: All knowledge is *a priori*.
- independent of the senses
- based on pure reason alone

examples: Descartes & Leibniz
- true infinity can be grasped by the intellect
- can form idea of the infinite without experiencing it or imagining it

(B) **Empiricism**: All knowledge is ultimately based on the senses.

examples: Locke, Berkeley, Hume

Problem: Can’t experience or imagine the infinite; so how do we know about it?

Radical response (Hume & Berkeley): Reject the concept of the infinite -- we don’t really have such a concept.

**BUT**: We do! Aristotle the empiricist at least tries to make sense of this

Standard example: The physical world as a whole with infinite diversity
II. Kant

In a nutshell: Some knowledge is both \textit{a priori} and sensory

\textit{"synthetic a priori" knowledge} = knowledge based on pure reason and gives us information about the physical world

\begin{align*}
\text{"Pure forms of intuition and understanding"} & \Rightarrow \text{"Built-in" forms by means of which we "process" the raw data of sensory experience} \\
\text{These make experience possible: All that can be known is known by means of them} & \\
\text{- can never look "behind the lens" to see things-in-themselves} & \\
\text{- can only know "things-through-the lens"} & \\
\end{align*}

A few examples: - space \\
- time \\
- causality \\
- infinity

As pure forms of intuition and understanding, these concepts pre-figure our experience. Part of how we experience things is in terms of spatial and temporal relations, for instance. Part of how we understand things is in terms of causal relations.

\textbf{Kant’s Claim:} Humans are \textit{metaphysically finite} beings in a \textit{metaphysically infinite} world.

\begin{align*}
\text{noumena} & & \text{phenomena} \\
\text{World-in-itself (noumenal world)} & & \text{World of experience (phenomenal world)} \\
\text{- in-principle unknowable} & & \text{- object of knowledge} \\
\text{- "raw data"} & & \text{- "constructed" by the way we "filter" raw data} \\
\text{- \textit{metaphysically infinite} (actually infinite)} & & \text{- \textit{mathematically infinite} (potentially infinite), but actually finite (based on finite human experience)} \\
\end{align*}

\textbf{SO:} The physical (phenomenal) world does not present itself to us as a whole: only in parts (no actual infinities in the physical world)
II. The Antinomies

Kant’s attempt to resolve Traditional debates:

1. Is the physical world infinitely old?
2. Is the physical world infinitely extended in space?
3. Is the physical world infinitely divisible?

The Antinomies = Kant’s arguments to indicate that the physical world is not given to us as a whole

**Strategy:** Show that, given the assumption that the physical world exists as a whole, one can argue both for and against the infinitude of the physical world.

1st Antinomy

**Claim 1A. (i):** The world cannot be infinitely old.

**Proof:**

The history of the world up to any given moment has been traversed.

So the history of the world cannot be untraversable (i.e., infinite).

**Claim 1A. (ii):** The world cannot be infinitely big.

**Proof:**

Suppose the world was infinitely big.

Then it must be given in experience all at once, or in a succession of parts.

**BUT:** It can’t be given all at once, since we can’t experience infinity.

**AND:** It can’t be given in a succession of parts, since there is no infinite history to do this.

**Claim 1B:** The world cannot be finitely old or finitely big.

**Proof:** Time and space are infinite and homogeneous.

So if the world was finitely old or big, then it would occupy some particular position in time and space.

**BUT:** There is no reason why it should occupy one such position over any other.

2nd Antinomy

**Claim 2A:** The world cannot be infinitely divisible.

**Proof:** Any composite whole must be more than the sum of its parts (beyond its parts, there is that which it is composed of).

**AND:** Nothing would survive an infinite division.

**Claim 2B:** The world must be infinitely divisible.

**Proof:** Any composite whole has spatial extent.

Space is infinitely divisible.

**SO:** Any composite whole must also be infinitely divisible.

Kant’s conclusion: The physical world as a whole does not exist! (Recall: it’s “constructed” by us.)

**OR:** The (actual) infinitude of the real noumenal world is beyond human understanding.
Moore: The physical phenomenal world appears to us with a mathematically infinite aspect. 

**BUT:** It is not itself mathematically infinite. As a whole, it does not exist.

**Further Kantian Claim:** *Reason* is metaphysically infinite.

Human understanding of the physical world is metaphysically finite. 

**BUT:** Our reason is metaphysically infinite.

- concept of God 
- concept of morality 
- etc. 

known via our infinite reason

**ALSO:** How do we know that the pure forms of intuition and understanding exist, and what they are? (In general, how do we know that the infinite noumenal world exists distinct from the phenomenal world?)

**Kant:** Through *pure reason*.

- **metaphysically infinite** (actually infinite) 
- tells us what the true nature of reality is 
- tells us what morality is 
- etc.

- **metaphysically finite** (potentially infinite) 
- tell us what the physical world is like 
- basis for science