General Philosophy

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Lecture 3:
Induction

Hume's Fork

- *Enquiry* IV starts with a vital distinction between types of proposition:
  - <u>Relations of ideas</u> can be known *a priori* (i.e. without dependence on experience) by inspecting ideas; hence their falsehood is inconceivable and they are necessarily true.

    e.g.   Pythagoras' Theorem. (*E* 4.1)

            $3 \times 5 = \frac{1}{2} \times 30$. (*E* 4.1)

            All bachelors are unmarried.
  - The modern term is <u>analytic</u> (as understood e.g. by Ayer): "true in virtue of its meaning".

Matters of Fact

– <u>Matters of fact</u> can't be known *a priori*, and their truth / falsity are equally conceivable:

e.g.   The sun will rise tomorrow. (*E* 4.2)

   The sun will not rise tomorrow. (*E* 4.2)

   This pen will fall when released in air.

– The modern term is <u>synthetic</u>: a proposition whose truth "is determined by the facts of experience" (Ayer, *LTL* 1971, p. 105).

■ So how can I discover a matter of fact which I neither perceive directly, nor remember?
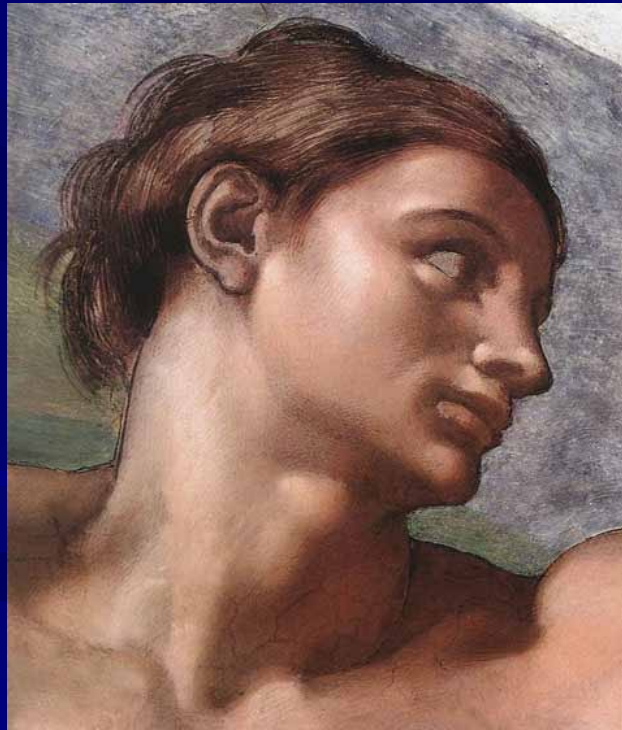
- Suppose we see a yellow billiard ball moving towards a red one and colliding with it. We expect the red one to move – but why?
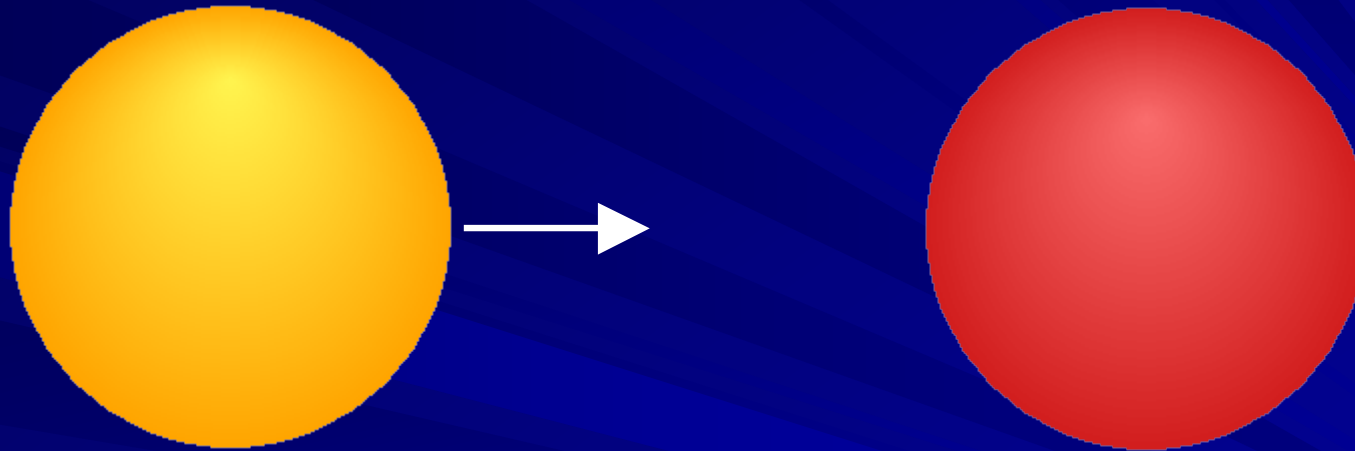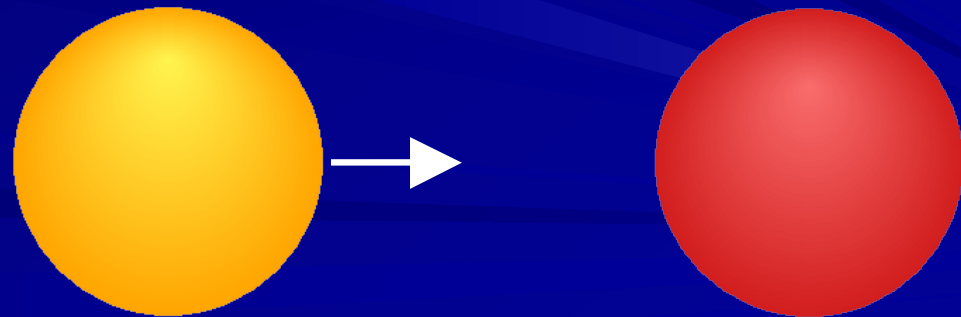

- Because we suppose a *causal* connexion between the two events. But in that case …

- How do we learn about causes and effects?

A Thought Experiment

■ Imagine Adam, newly created by God, trying to envisage the effect of the collision:

– how could he possibly make any prediction at all in advance of experience?

The Need for Extrapolation

- All inference to matters of fact beyond what we perceive or remember seems to be based on causation, and all our knowledge of causal relations comes from experience.

- Such learning from experience takes for granted that observed phenomena provide a guide to unobserved phenomena.

- We thus *extrapolate* from past to future on the assumption that they resemble. But do we have a rational basis for doing so?

Four "Kinds of Evidence"

- "It is common for Philosophers to distinguish the Kinds of Evidence into *intuitive*, *demonstrative*, *sensible*, *and moral*". (*Letter from a Gentleman*, 1745, p. 22)

- By "intuition", Hume means immediate self-evidence: the way we know that something is identical with itself, or that 2 is greater than 1.

- "Sensible" evidence means *from the senses*.

- "Demonstrative" and "moral" reasoning are now commonly called "deduction" and "induction" …

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Locke on Reasoning

- In <u>demonstrative</u> reasoning, each link in the inferential chain is "intuitively" certain.
  - "reasoning concerning relations of ideas" [Hume]
- In <u>probable reasoning</u>, some links in the inferential chain are merely probable.
  - "moral reasoning", "reasoning concerning matter of fact" [Hume]: "factual inference" for short
- For Locke, <u>both</u> types of reasoning involve rational *perception* of the links (IV xvii 2).

Hume on Inferring Uniformity

- **What ground can we give for extrapolating from observed to unobserved?**
  - Self-evident intuition? <u>No</u>.
  - Demonstrative reasoning? <u>No</u>: neither of these, because it's clear that extrapolation *could* fail, so it can't be a matter of pure logic.
  - Sensory knowledge? <u>No</u>: what we perceive of objects gives us no insight into the basis of their powers, hence no reason to extrapolate.
  - Factual inference? <u>No</u>: that would be circular.

Review: The Part (i) Argument

- All factual [moral, probable] inference is founded on causation
  - Because causation is the only relation that enables us to infer from one thing to another.
- All knowledge of causal relations is founded on experience
  - A priori, we can know nothing of causation.
- Hence all factual inference is founded on experience.

The Pivot

- All factual inference is founded on experience.
- All inference from experience is founded on a principle of uniformity or similarity.
  - Because it requires that we extrapolate from our experience, on the basis that what we have not yet experienced will be similar.
- Hence all factual inference is founded on this Uniformity Principle.

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The Part (ii) Argument

- But neither intuition, nor sensation, nor demonstration can ground such a principle.
- And factual inference – as we have seen – itself depends on the Uniformity Principle, so any attempt to establish the Principle by factual inference will be arguing in a circle.
- It follows that there is no rational basis for the supposition of Uniformity, and hence no rational basis for factual inference.

The Basis of Factual "Reason"

- Our "reason" is fundamentally based on a brute assumption of uniformity, rather than any insight into the nature of things.
  - Hence human reason differs from animal reason only in *degree*.
  - Locke's supposed "perception" of probable connexions is wishful thinking.
  - No causal interactions are really *intelligible*: we discover what causes what not by pure thought, but by observation of uniformities.

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Does This Imply Irrationalism?

- Does Hume deny that inductive inference is founded on any sort of rational insight into why nature should be uniform?
  - YES!

- Does Hume think that all inferences about "matter of fact" are equally hopeless, so that there's no rational ground for preferring one to another?
  - NO!

The Problem of Demarcation

- Religious belief is founded on "whimsies and prejudices" of the imagination.

- Science is founded on the instinctive, non-rational belief in uniformity.

- So what right has Hume to prefer "science" over "superstition"? His answer is to favour reasoning *consistently* with this irresistible instinctive belief, which is so utterly essential to human life and thought.

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Implications for Science

- **Systematisation rather than Intelligibility**
  - "the utmost effort of human reason is, to reduce the principles, productive of natural phenomena, to a greater simplicity, and to resolve the many particular effects into a few general causes … But as to the causes of these general causes, we … in vain attempt their discovery." (*E* 4.12)

- **Instrumentalism**
  - Newton's instrumentalist attitude to gravitation thus provides a model of good science.

The Gap in Hume's Argument

- Hume takes for granted that all "probable" arguments must be based on experience.
- So it might be possible to escape his argument if induction could be justified using *a priori* probabilistic considerations.
- Though most philosophers are sceptical, interesting attempts have been made by:
  - Bruno De Finetti (1937), D.C. Williams (1947), David Stove (1986), Sir Roy Harrod (1956), Simon Blackburn (1973), J. L. Mackie (1979)

Other Attempts to Answer Hume

- "Analytic" Justification of Induction
  - Induction is rational by definition: it is partly constitutive of our concept of rationality.
- "Inductive" Justification of Induction
  - Induction is justified by its past success.
- "Pragmatic" Justification of Induction
  - We are pragmatically (rather than epistemic-ally) justified in relying on induction, because it will work if any method of prediction will.

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Hume versus Strawson

- P. F. Strawson (Univ and Magdalen) famously advocated the "Analytic Justification".

- However it's not clear that it really engages with Hume's problem. Hume himself would agree that we *call* induction "rational", and even that we're right (in a sense) to do so.

- His sceptical result doesn't concern this use of words: it questions our *epistemic justification* for inductive extrapolation.

The Inductive Justification

■ Max Black (1958) argued that induction can be justified inductively without vicious circularity, by distinguishing between an inductive *rule* and an inductive *premise*.

■ But Hume's question concerns the *rational well-foundedness* of taking the observed as evidence for the unobserved. A rule or premise can confer this rational grounding only if it is itself rationally grounded. So any circularity here is indeed vicious.

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The Pragmatic Justification

- Hans Reichenbach (1949) argued that if there is any general rule, deterministic or statistical, to be found – e.g. that 61% of As are Bs – then induction will find it, and is better than any alternative method.

- But this argument just takes for granted that we are looking for an inductively consistent rule: one that stays the same over time.

- Besides, Hume's pragmatic justification is stronger: we can't help reasoning inductively!

Mellor on Warranted Induction

- Mellor takes an "externalist" approach: induction is *warranted* if the world is such as to make inductive predictions probably true (e.g. because the world does in fact behave consistently over time), *even if we are unable to know that this is the case*.

- For the externalist, a belief can be justified by how things are, even if the believer is unaware of what justifies his or her belief.

- We'll consider externalism in "Knowledge".

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Goodman's "New Riddle" of Induction

- Call something *grue* if it is first examined before noon on 1st April next year and is *green*, or first examined later and is *blue*. (*Bleen* is the other way round.)

- Suppose all emeralds examined so far are *green*. Then we have two rival theories, both supported by all the available evidence:

  (a) All emeralds are *green*. ("straight" theory)

  (b) All emeralds are *grue*. ("bent" theory)

- How can we justify preferring (a) over (b)?

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- "Grue" seems artificial because it's defined in terms of "green" and "blue". But "green" can be defined in terms of "grue" and "bleen"!

- The easiest answer is to say that Goodman's bent predicates don't latch on to *real properties*, and inductive support depends on *real similarities* between things, not on purely *syntactic* relationships between sentences (unlike formal deductive validity).

- To back this up, consider a how miner on 1st April could know the colour of an emerald that he digs up: to tell whether it's grue or bleen, he'd have to know the time.

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