Phil. 4340
Notes: Course Requirements, Knowledge

To discuss today:
    This course: requirements, subject, guidelines
    What is knowledge?
    Why is knowledge important?

I. About this Class

Review syllabus. Some highlights:
    · Who should take this class?
        - Class will contain:
            Lots of arguments
            Theoretical questions about knowledge (see below)
            Controversial ideas.
    · Course requirements. Tests, papers.
    · Miscellaneous guidelines:
        Come on time.
        Come to office hours.
        Participate.
    · What should you do now?
        Get text & reserve readings.
        Read the syllabus.

II. Different senses of "know"

    · Knowing a person
    · Knowing how to do something
    · Knowing *that* so-and-so is the case
Epistemologists focus on the third one, factual knowledge / propositional knowledge

III. The Importance of Knowledge

· Moore's Paradox: All of the following sentences seem paradoxical:
    "It is raining but I don't believe it."
    "It is raining, but I have no reason to think so."
    "It is raining, but that's not true."
    "It is raining, but I don't know it is."
· *Are* they contradictory? What's wrong with them?
    Answer: - All claims are *implicit* knowledge claims. (Speaker implies that he knows what is asserted.)
            - Second half of the sentence denies what the first half *implies*.
· If this is true, then the concept of knowledge is very important.

IV. The traditional definition of "knowledge"

    S knows that *p* iff: *i)* S (at least) believes that *p*,
                            ii) p is true, and
                            iii) S is justified in believing that *p*.

- The truth condition ("factivity"): The concept of knowledge is said to be "factive": to say someone knows that so-and-so, implies that so-and-so is the case. An argument:
  1. Knowing-that implies knowing-wh---. (knowing who, knowing where, knowing whether, etc.)
  2. Knowing-wh--- implies true belief. "Does John know when the exam is?"
  3. So knowing-that implies true belief.
  - Imaginative projection explains apparent exceptions.
- Justification: This typically means having good evidence, or good reasons, for a belief. More generally: forming the belief in such a way that it would be very likely to be true.
  Example: The Gambler's lucky guess.

V. Gettier's refutation of the traditional definition

- Necessary vs. sufficient conditions.
  - Gettier says: the above conditions are not *sufficient.* How to show this: find a case in which the conditions are satisfied, but S does not know that *p.*
- *First example:* "The man who will get the job has 10 coins in his pocket."
- *Second example:* "Either Jones owns a Ford, or Brown is in Barcelona."
- How the examples work: S has a justified but false belief in *q*, S validly infers *p* from *q*, and *p* happens to be true. S then has a justified, true belief in *p*, but does not know that *p.*
- Premises of the argument:
  a. Justification does not entail truth.
  b. If S is justified in believing *q*, and S validly infers *p* from *q*, then S is thereby justified in believing *p*. (This is called "*the closure principle* (for justification)")
  c. The Gettier cases are not cases of knowledge.

VI. Michael Clark's analysis

S knows that p iff: 1) S at least believes that *p*,
2) *p* is true,
3) S is justified in believing that *p*, and
4) S's belief that *p* is "fully grounded".

- What is required to be 'fully grounded'?
  - All the beliefs it is based on, and the beliefs *those* beliefs are based on, and so on, are also true beliefs. I.e., there is no false belief in its evidential ancestry.
- Problem with Clark's definition: *Phony Barn Country Example.*

VII. The Defeasibility Analysis

S knows that *p* iff: 1) S at least believes that *p*,
2) *p* is true,
3) S is justified in believing that *p*, and
4) there are no (genuine) defeaters for S's justification for believing *p*.

- *Definition: Defeater for S's justification for believing p:* A true proposition that, *if* added to S's beliefs, would make S no longer justified in believing that *p.*
- Notice how this handles the Gettier cases + the stopped clock case.
- Problem: misleading defeaters. *The case of Deluded Mrs. Grabit.*
  Need an account of misleading/genuine defeaters. (*Note:* "genuine" is defined to be the contrast to

"misleading".) Three suggestions:

1. A misleading defeater is one for which there exists a restorer. (This doesn't work.)
2. A *genuine* defeater is one such that (a) S is justified in denying it (or: S's justification for believing *p depends on* S's being justified in denying the defeater), and (b) also, S is justified in denying any other defeater that it entails. (Lehrer & Paxson)
3. A misleading defeater supports some false proposition. (Chisholm)
4. A misleading defeater is one that defeats S's justification for *p by means of* supporting a false proposition. (Klein)

· More about defeaters: a distinction:
  - A *rebutting defeater* for *p* is one that supports ~*p*.
  - An *undercutting defeater* for *p* is one that undermines the justification for *p* without providing any justification for a contrary belief.

VIII. Nozick's Counter-factual Conditions

S knows that *p* iff: 1) S at least believes that *p*,
                         2) *p* is true,
                         3) If *p* were false, then S would not believe that *p*, and
                         4) If *p* were true, then S *would* believe that *p*.

· Background: distinction between
  - *Indicative conditional:* "If Oswald didn't shoot Kennedy, someone else did."
  - *Subjunctive (counterfactual) conditional:* "If Oswald hadn't shot Kennedy, someone else would have."
· The Lewis-Stalnaker analysis of counterfactuals:
  - Relies on the idea of (logically) *possible worlds.* These are hypothetical ways the world could have been.
  - 'Nearness' of worlds: 'Nearby' or 'close' possible worlds are worlds that are similar to our own (only small changes)
  - "A □→B" = "In all the nearby possible worlds [or: the *nearest* worlds] in which A holds, B holds."
· Nozick's analysis of knowledge, intuitive idea:
     S's belief "tracks the truth" in nearby possible worlds.

IX. The Closure Principle

· Two versions:
  - *Closure for knowledge:* If S knows that *p*, and (S knows that) *p* entails *q*, then S knows (/is in a position to know) that *q*.
  - *Closure for justification:* If S is justified in believing that *p*, and (S is justified in believing that) *p* entails *q*, then S is justified in believing (/has justification for believing) that *q*.
· Terminology: A set is "closed under entailment" if, whenever *p* is in the set, everything entailed by *p* is also in the set. Hence, the principle is: the set of known/justified propositions is 'closed under entailment'.
· This principle fails on Nozick's account.
  - *Example*: The brain in the vat scenario. You know you have two hands, but you don't know you're not a (handless) brain in a vat. (See why this is so, on N's theory.)
  - *Implausible consequences:*
       You can know that (*p* & *q*), without knowing that *p*.
       You can never know "I'm not wrong about *p*."

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Notes: Epistemological Examples

This is a list of examples we've discussed, and what the standard assessment of them is. For you to think about: which analyses of knowledge are supported/refuted by these examples & the standard views of them?

Gambler's Lucky Guess:
  A gambler at the racetrack believes that Seabiscuit is going to win the race, on the grounds that he "can just feel it." The gambler in fact has no extrasensory perception or any other relevant knowledge. But as it happens, Seabiscuit does win. "I knew it!" the gambler exclaims.
Verdict: The Gambler did *not* know [Seabiscuit was going to win].

Gettier's Case:
  Smith justifiedly believes [Jones owns a Ford]. He has seen Jones driving a Ford many times, heard Jones talk about his Ford, etc. Smith validly infers from this, and believes, [Jones owns a Ford, or Brown is in Barcelona]. Smith has no idea where Brown is; he just picked Barcelona at random. It turns out that Jones actually doesn't own a Ford (it was just sold, or whatever), but, coincidentally, Brown is in Barcelona.
Verdict: Smith does *not* know [Jones owns a Ford, or Brown is in Barcelona].

Stopped Clock:
  You look at the clock on the wall. It reads 3:00. You form the justified belief that it is 3:00. Unbeknownst to you, the clock is actually stopped; however, it just happens to be 3:00 anyway.
Verdict: You do *not* know [it is 3:00].

Phony Barn Country:
  You are driving through an area where there seem to be many barns. Unknown to you, all but one of them are mere barn facades that look just like barns from the road. Among all the phony barns, there is one real barn. You believe each of the objects (phony and real barns) to be barns. You point out the window, happening to point at the one real barn, and you say, "That's a barn."
Verdict: You do *not* know [that's a barn].

Tom Grabit, the case of Tom's actual twin:
  You see Tom Grabit take a book in the library, hide it in his coat, and sneak out. You know Tom and know perfectly well what he looks like. You justifiably believe [Tom Grabit stole a book from the library]. Unknown to you, Tom has an identical twin brother, John, who is a kleptomaniac and looks just like Tom. However, it was Tom, and not John, who actually stole the book.
Verdict: You do *not* know [Tom stole the book].

Deluded Mrs. Grabit:
  Same as above, except Tom has no twin brother. However, Tom's mother is deluded and has been going around *saying* that Tom has an identical twin brother. You do not know that Tom's mother has been saying this, nor do you know that she is delusional. If you had heard her say this, you would have given up your belief that Tom stole the book.
Verdict: You *know* [Tom stole the book].

All-Purpose Defeater:
You correctly and justifiably (but with fallible justification) believe p. Let q be any extremely improbable but true proposition, not necessarily one that has anything to do with p. (For example, suppose there is a lottery with a million tickets. Suppose ticket #549873 is in fact going to win, though no one knows this. Then q = [Ticket #549873 will win] is highly improbable but true.) Then the proposition $[p \supset q]$ is a defeater for q. (See why.)

Verdict: $[p \supset q]$ does *not* undermine your knowledge of p.

Brain in a Vat:
The case of the actual brain in a vat:
There is a disembodied brain being kept alive in a vat of nutrients, while scientists electrically stimulate it to cause in it normal sensory experiences. The brain falsely believes it is a normal person, and various other false propositions about the physical world.

Verdict: The brain knows nothing about the external world.

The case of the normal person:
There are in fact no brains in vats, nor is there any technology for making them. However, it is logically possible for there to be a brain in a vat. You are a normal person in a normal physical world. You look at your hand and believe that you have a hand.

Verdict: Controversial.
Skeptic: You don't know you have a hand. You don't know you're not a BIV.
Nozick: You know you have a hand. You don't know you're not a BIV.
Moore: You know you have a hand. You know you're not a BIV.
DeRose: In some contexts you "know" that you have a hand and that you're not a BIV. In others, you know neither that you have a hand nor that you're not a BIV.

Bank Cases:
Case A:
Keith and his wife are driving home on Friday. They go to the bank to deposit their paychecks, but they notice that the lines are long, so Keith suggests that they deposit the checks on Saturday. His wife wonders if the bank will be open. He says: "I know it'll be open—I was there two weeks ago on Saturday. It's open til noon." Keith's belief is true and justified.

Verdict: Keith *knows* [the bank will be open].

Case B:
As above, except that Keith & wife have just written a very important check, which will bounce if they do not deposit their paychecks by Saturday, leaving them in a *very* bad situation. His wife says, "Banks do change their hours sometimes. Do you know they will be open?" Keith still believes, just as much as in case A, that the bank will be open; however, this time he says, "No, I better go make sure." Again, Keith's belief is true and as justified as in case A.

Verdict: Keith does *not* know [the bank will be open].

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Notes: Contextualism

Basic idea: the standards for knowledge shift depending on context. What does this mean?

Important distinction:
- *Subject factors:* the circumstances that the person who is said to know (or fail to know) is in.
- *Attributor factors:* the circumstances that the person who is *attributing* knowledge is in.
- Contextualists claim that the truth of knowledge-attributions depends (in part) on *attributor* factors, not just subject factors.

Some examples of context-sensitivity, for other words:
    "I"
    "today"
    "here" (context-sensitive on two dimensions)
- The above are *indexicals:* Roughly, words whose reference shifts depending on the conditions in which they are used. They refer to whatever stands in a certain relation to the utterance.

Standards of knowledge:
- In order to know that *p*, one must (be in a position to) rule out certain alternatives to *p*. Which alternatives are *relevant*?
- Having "high standards" means that a lot of alternatives are relevant.
- Having "low standards" means relatively few alternatives are relevant.

Examples of context-sensitivity for "know":
- The *Bank Cases*. (Importance of what one is said to know affects standards for knowledge)
- The mentioning of a possibility may make it relevant.
- The considering of a possibility may make it relevant.
    a) On the part of the subject
    b) On the part of the attributor

Contextualists' diagnosis of skepticism:
- Skeptics raise alternative possibilities (brains in vats, etc.)
- These alternatives are irrelevant in normal contexts.
- But the skeptic changes the conversational context to make these alternatives relevant.
- Hence, the skeptic is right that we don't "know" various things (in the sense used in his context), but we are also right in saying that we *do* "know" these things (in the sense used in our normal context).
    - *Note:* This is considered a skeptic-unfriendly diagnosis: Skeptics mistakenly think they're using "know" in its ordinary sense.

Question for comprehension:
  Does *whether we know P* depend upon the speaker's interests? Can one take away other people's knowledge by mentioning alternative possibilities?

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Extra Material: The Failure of Analysis

Background: The failure of analysis

- Philosophers tried hard to analyze concepts over the last century.
  - The school of "linguistic analysis": The job of philosophy is to analyze the meanings of words. This was a consequence of the doctrine of logical positivism.
  - This project was given as good a shot as anyone could ask for.
- The payoff? Bupkis.

The Traditional, Lockean View of Concepts

- Concepts are compositional. They divide into 2 classes:
  - Simple concepts. Few in number, generally of simple sensory qualities.
  - Complex concepts (the majority). Built up from simple ones by "cut & paste" operations.
- "Ideas" are introspectible, (sometimes) occurrent mental states.
- Concept application is governed by definitions. Understanding a concept is knowing the definition.

Metaphysical Interlude: Quality Spaces

- Each object has a 'nature': a complete, fully determinate, qualitative way of being.
- Natures have internal similarity relations to each other.
- They can be arranged into a 'space of natures' (or property space).
- Example: the color space.
- Abstract properties can be formed by grouping together points in the property space.

A Dispositional (Quasi-Wittgensteinian) View of Concepts

- A concept is a way of grouping together natures in the property space, drawing a boundary around a region in the space.
- Concepts are dispositional. The dispositions are dispositions to classify cases together, and/or to apply certain words.
  - Understanding a concept is possessing appropriate dispositions.
  - The contours of the concept are determined (constitutively) by the dispositions.
  - Dispositions are acquired largely through environmental influences and nonconscious processing, not through conscious decisions.
    - Consequence: We access concepts through linguistic intuitions, rather than through direct introspection.
- Conceptual dispositions are influenced by multiple factors, including:
  - Practical interests/values.
  - What kinds of objects we find in the world. We tend to form concepts when we see objects clustered together in the property space.
  - Word usage in one's speech community. Most concepts are very closely tied to words. People imitate others' word usage. Word usage evolves over time in a messy, unpredictable way.
    - Many words originate in metaphorical/extended usages. Ex.:
      logos (Greek, the word) ➞ *logic*
      phainomenon (Greek, appearance) ➞ *phenomenon, phenomenal*
      hap (Old Norse, chance, luck) ➞ *happiness, haphazard*

· Almost all concepts are undefinable. In particular, almost all *lexical concepts* (concepts expressed by a single word in a natural language) are undefinable.
  - Exception: mathematical concepts

Lessons for Linguistic Analysis

1. No reason to think we can define lexical concepts.
2. No reason to think it would be interesting or useful if we could.

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Review**

Know what these things are:
    Moore's paradox & what it shows
    Traditional def. of knowledge
    Gettier example
    "Fully grounded"
    Defeaters & defeasibility analysis
      rebutting vs. undercutting
      misleading vs. genuine
    "Tracking"
      + counter-factual conditionals & traditional analysis of them
    Closure principle
    Contextualism
    Subject factors & attributor factors
    Indexicals
    Skeptical scenarios
      brain in a vat scenario

Know what views these people defended:
    Gettier
    Clark
    Lehrer & Paxson
    Nozick
    DeRose

Be familiar w/ these arguments:
    Gettier's criticism of traditional def.
      & what premises the argument requires
      what it shows about traditional def.
    Why Nozick rejects closure

Know these examples & what they show:
    Gambler's lucky guess
    Gettier ("Jones owns a Ford, or Brown is in Barcelona")
    Phony barn country
    Deluded Mrs. Grabit
    Brain in the vat: contextualist view & Nozick's view
    Bank cases

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Notes: The Infinite Regress Argument for Skepticism

I. The Infinite Regress Problem: Introduction

Basic Ideas
- Sometimes we believe things for *reasons*.
- This is one (alleged) way a belief can be *justified*.
- Justificatory dependence: *Jp* dep *Jq*
  - This means you would need to be justified in believing *q in order* to be justified in believing *p*. *Jq* is a precondition for *Jp*.
  - This is true if *q* is your reason for believing *p*.
  - It may be true even if *q* isn't your actual reason for believing *p*, but is somehow presupposed or required by your belief that *p*. (Examples below.)
  - *Jp* means you have justification for *p*. Does not entail that you actually believe *p*.
- Properties of Just. Dep.: Asymmetric & Transitive?

The Structure of Justification
  Our justified beliefs may have one of four structures:

Infinite, linear
(Infinitism)

Finite, linear
(Foundationalism)

Circularity
(Coherence Theory)

Empty
(Skepticism)
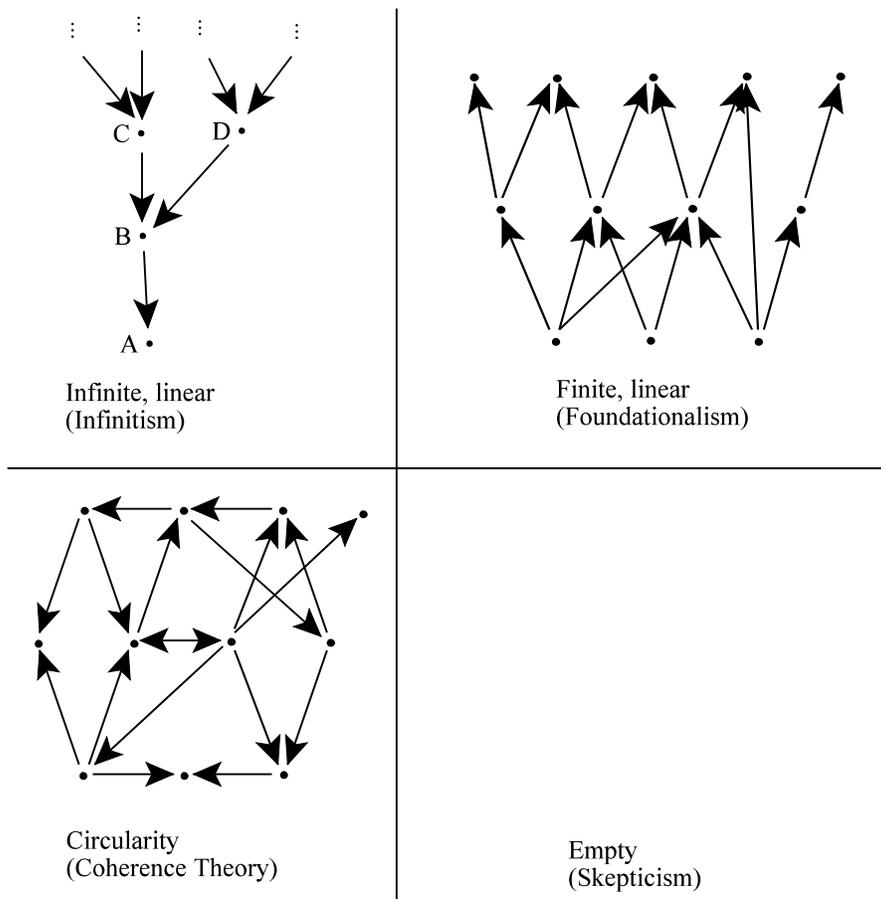
II. The Infinite Regress Argument for Skepticism

1. S knows (/has a justified belief) that P only if S has some reason for believing that P. (Premise.)
2. S's reason for believing that P must also be known (/justified). (Premise.)
3. There are only 3 possible kinds of series of reasons:
    a. circular series,
    b. infinite regress, and
    c. the foundationalist structure. (Premise.)
4. A circular series of reasons does not generate knowledge (/justification). (Premise.)
5. No one can complete an infinite series of reasons. (Premise.)
6. The foundationalist structure cannot yield knowledge (/justification). (From 1, 2)
7. Therefore, we have no knowledge (/justified belief). (From 3-6)

See below for arguments for (1), (4), (5).

III. Against Foundationalism

Candidates for foundational beliefs:

Perceptual beliefs
    P = There is a white piece of paper before me.
    This depends on:
        Q: I have the capacity to discriminate white pieces of paper.
        U: There are no factors present that would probably cause me to make mistakes about P.

Beliefs about immediate experiences
    P = It appears to me that something is blue.
    This depends on:
        U: There are no factors present that would probably cause me to make a mistake about P.

About the argument
    · Similar points could be made about any allegedly basic belief.
    · Oakley is not claiming that we *infer* P from U in the above examples. He is claiming that JP depends on JU.
    · Argument for this: If U were not justified, then P would not be justified.
      [Think about: Is this sufficient for (JP dep JU)?]
    · Two foundationalist responses that Oakley rejects:
        1. U just has to be *true*, we don't have to justifiedly believe it.
        2. U isn't part of the justification for P, but ~U would be a defeater for it.
      Reply: In a case where you have no idea whether U is true, you are not justified in P.

IV. Against the Coherence Theory

A. Intuition: circular reasoning is vicious.
    Coherentist says: "big circles are okay; only little circles are bad". This seems arbitrary.

B. The alternate-coherent-systems objection
    · Possible to construct alternative coherent systems of beliefs, one including P, one including ~P.
    · Thus, both P and ~P would be justified.
    · This means neither is justified.
    · So nothing is justified (by coherence).

- *Reply:* Only actually held beliefs count.

C. Justification too easy to generate
1. Coherence theory implies that if S has a coherent set of beliefs, then any arbitrary belief can easily be justified.
    - Assume P, Q, R, and S are coherent. T is an unrelated belief.
    - The following is also coherent: (P&T), (Q&T), (R&T), (S&T).
    - Therefore, (P&T), etc., would be justified.
    - Therefore, T is justified.
    - So any arbitrary belief may easily be justified.
2. But one cannot easily render any arbitrary belief justified (even if one has a coherent system).
3. So the coherence theory is false.

V. Against Infinitism

Problems
1. How to distinguish infinite series of justified beliefs from infinite series of unjustified beliefs?
2. How to know that we have an infinite series?
3. Difficult to articulate even a few stages of the series.
4. If P is justified by an infinite series, ~P could equally well be justified. Perhaps any belief could be justified, by finding some infinite series?
5. Too easy to have justified beliefs according to infinitism. Suppose I believe:
    - There is a carpet, the first foot of which is red.
    - There is a carpet, the first 1.5 feet of which is red.
    - There is a carpet, the first 1.75 feet of which is red.
        ...
    Surely this isn't enough for all those beliefs to be justified.
6. Any arbitrary belief can be justified. If the first series is justified, then the second one is:
    P1 ⬅ P2 ⬅ P3 ⬅ ...
    P1&T ⬅ P2&T ⬅ P3&T ⬅ ...

VI. Objection: Skepticism Self-Defeating

"[T]he above discussion provides the basis for a suitable rejoinder to the critic who would turn the conclusion against itself, remarking that if it is true, we cannot be justified in believing it, or indeed the premises from which it is drawn. The convinced skeptic will of course embrace this conclusion, kicking away his ladder along with everything else. But in any case, I will regard my current purpose as fulfilled if my reader accepts that the conclusion is derivable from the currently unquestioned." (385-6)

Is this a response to the objection?

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Notes: The Coherence Theory of Justification

I. Problem for Foundationalism

- Function of Justification: Means to truth.
- Therefore, justified beliefs should be *thereby* likely to be true.
- Let B be a foundational belief.
    - B has some feature F that renders B foundational.
      ☞ F distinguishes foundational beliefs from arbitrary beliefs.
    - Beliefs with F should be thereby likely to be true.
    - The believer should be aware of these facts: (a) that B has F, and (b) that beliefs with F are likely to be true.
    - So B is supported by reasons. Therefore, B is not foundational.
    - By *reductio*, no belief is foundational.

II. The Coherence Theory

A. Basic idea
- Alternative views are bad: Skepticism, foundationalism, infinite regress.
- Justification is circular.
- This is not a theory of *truth*.

B. Nonlinear conception of justification
- Overall belief system justified by its coherence.
- Individual belief justified by its connection to that system.

C. Coherentist observation
- How can a coherentist accommodate observation?
- We have "cognitively spontaneous beliefs".
- These are initially unjustified. (See arguments against foundationalism.)
- They become justified when many of them fit together into a coherent system.
- The Observation Requirement: A coherent belief system is justified only if it includes a variety of cognitively spontaneous beliefs, and beliefs attributing high reliability to them.

III. Objections

A. Knowledge of one's own beliefs
- Such knowledge is required by the theory.
- This is empirical knowledge.
- It looks foundational. Must know what one's belief system is, before one can judge it to be coherent.
- Reply: "[N]o claim is being made that these metabeliefs possess any sort of intrinsic or independent justification . . . . Rather, the approximate correctness of these beliefs is an essential presupposition for coherentist justification, and ... such justification ... must be understood as relativized to this presupposition." (400)

B. Mustn't Cognitively Spontaneous Beliefs Have Some Degree of Justification?
- Why are coherent systems likely to be true? The Witness Scenario:

- Several witnesses to a crime are interviewed, with no opportunity to collaborate. The witnesses independently tell highly coherent stories.
- Coherence of false stories is highly unlikely.
- So this is evidence of the truth of the stories.
- This is true even if no witness has any initial degree of credibility. "For as long as we are confident that the reports of the various witnesses are genuinely independent of each other, a high enough degree of coherence among them will eventually dictate the hypothesis of truth telling as the only available explanation of their agreement—even, indeed, if those individual reports initially have a high degree of *negative* credibility, that is, are much more likely to be false than true . . . ." (401)

· Note: BonJour's last claim is false.

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Notes: Infinitism

Background concepts

· *Warrant:* The thing that, when added to true belief, yields knowledge. (technical use due to Plantinga)
· *Occurrent beliefs:* Beliefs that one is thinking at the moment.
· *Dispositional beliefs:* Things you believe that you aren't thinking of now. (Similar to, but not the same as: disposition to occurrently believe.)

Objection to Foundationalism

· Similar to BonJour's objection: Assume that feature F makes a belief foundational.
· Are beliefs with F thereby likely to be true? Answers:
  a. Yes. Then we have a reason for the belief.
  b. No. Then why should you reason from such beliefs?
  c. No opinion. Ditto.

Objection to Coherentism

· The warrant-transfer form: beliefs transfer warrant around in a big circle.
  - Circular reasoning cannot increase the credibility of any beliefs
· The warrant-emergent form: Coherence of a belief system makes the whole system justified.
  - This is really a form of foundationalism, where F = belonging to a coherent belief system.
  - So it falls to the same objection as foundationalism.

Infinitism

· Infinitism follows from:
  - *Principle of Avoiding Circularity (PAC):* if y is in the evidential ancestry of x, then x is not in the evidential ancestry of y.
  - *Principle of Avoiding Arbitrariness (PAA):* if x is warranted, there is a reason available for x, and a reason for the reason, etc.
· Notes on PAA
  - Availability: the reason need not be (occurrently) believed. It may be dispositional.
  - Reasons: Many accounts possible, need not determine the best account here.
· Not just any infinite series suffices for justification.

Objections

First objection: We have no place to start our argument.
Reply
  · We start by doubting some belief of ours.
  · As we find a reason for it, it becomes more justified. The farther we go in the series, the more credible the first belief becomes.

Second objection: We can't have infinitely many beliefs.
Reply
· Infinitism does not require infinitely many occurrent beliefs.
· We can have infinitely many dispositional beliefs.

Third objection: We can't have infinitely many beliefs *available*, because the beliefs must be more and more complex, and at some point we couldn't understand them. (Arithmetic example.)
Reply
· There could be an infinite set of beliefs that do not increase in complexity. E.g. "This is red", "that is red", etc.

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Notes: Foundationalism & Phenomenal Conservatism

I. Foundationalism

(i) Some knowledge is foundational, and
(ii) all other knowledge is based on foundational knowledge.

Foundational belief/knowledge: Belief/knowledge that has foundational justification.
Foundational Justification: non-inferential justification; justification that does not depend on further beliefs.

II. Traditional Arguments for Foundationalism

A. The Infinite Regress Argument
  1. A series of reasons must have one of three structures:
     a. Circular structure
     b. Infinite regress
     c. Foundationalist structure.
  2. Circular reasoning cannot yield knowledge/justified beliefs.
  3. No one has an infinite series of reasons.
  4. Therefore, (1c) is the only possible structure of knowledge/justified beliefs. (From 1, 2, 3.)
  5. There is knowledge/justified belief.
  6. So foundationalism is true. (From 4, 5.)

B. The Appeal to Examples
  a. I know that I am thinking.
  b. I know that A = A.

I don't know either of these by rehearsing 'arguments' for them.

III. Question for Foundationalism

What, if anything, *differentiates* foundational beliefs from arbitrary beliefs?

A Principle of Foundational Justification:
Phenomenal Conservatism: If it seems to S that P, then S thereby has at least some justification (in the absence of defeaters) for believing that P.

"It seems to S that P":
  · This is a sui generis propositional attitude.
  · Reported in English by "it seems that P," "it appears as if P," "P is obvious," "P is plausible," etc.
  · Not a belief.
  · Not under voluntary control. Often unaffected by beliefs.
  · Includes perceptual experiences, quasi-memories, intuitions

Justification: This is read in an *internalist* sense. It addresses questions like:
   What am I to believe? (Foley) More elaborately:
   What does it make sense for S to believe, given his desire to have true beliefs and avoid false ones, and given his present internal state?

Defeaters:
  These would be other things that S has justification for, that remove justification for P. Two kinds:

a. Rebutting defeater: justification for ~P.
b. Undercutting defeater: grounds for doubting that one's belief is reliable (or: satisfies the conditions for knowledge, other than the belief and truth conditions).

IV. The Self-Defeat Argument

All alternatives to PC are self-defeating.

1. All (relevant) beliefs are based on appearances. (Not relevant: wishful thinking, faith, self-deception.)
2. A belief is justified only if what it is based on is a source of justification for the proposition believed.
3. If PC is false, appearances are not a source of justification for beliefs.
4. Therefore, if PC is false, then all (relevant) beliefs are unjustified. (From 1, 2, 3)
5. So alternative epistemological theories to PC are self-defeating: if such a theory is true, our belief in it would be unjustified. (From 4)

Objections to discuss
· Maybe beliefs are caused by external facts.
· Or reliable mechanisms.
· Maybe only *some* appearances confer justification. (Intuitive? Perceptual?)

V. An Internalist Metacoherence Argument

1. Assume that E affects the justification of beliefs, where E is some "external" factor that is logically independent of how things appear to the subject. (Assumption for reductio.)
2. Then the following is possible:
   a. S is justified in believing P.
   b. S is not justified in believing Q.
   c. But P and Q seem the same to S in all relevant respects. (From 1.)
3. In such a case, S rationally ought to believe that P while denying or withholding judgment with respect to Q. (From 2, meaning of "justified".)
4. Upon reflection, S could rationally say: "I believe P, and I refuse to believe Q, even though Q seems to me just as true, reliable, justified, and otherwise worthy of belief in all relevant respects." (From 2, 3.)
5. One could not rationally say that. (Premise.)
6. Therefore, E does not affect the justification of beliefs. I.e., only the appearances matter. (From 1-5.)

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Bonus Material: The Taxonomy of Knowledge

Traditional Taxonomy of Knowledge

I. Inferential knowledge
  A. Deduction
  B. Induction
  (C. Inference to the best explanation)
II. Non-inferential/foundational knowledge
  A. Observation
   1. Sensory
   2. Introspection
  B. A priori intuition

Traditional Paradigms of Knowledge

· Euclid's *Elements*: Axioms, theorems
· Observation, e.g., seeing a red sphere directly in front of you
· Scientific reasoning

Problems with Traditional Taxonomy & Paradigms

· Recognitional knowledge
  - Ex.: Recognizing a voice or face
  - Why it's not exactly foundational:
    * Depends on background knowledge. Could not recognize without prior experience with object
    * Could not recognize without perceiving other features of object.
  - Why it's not exactly inferential:
    * Subject cannot identify specific features on the basis of which object is recognized.
    * Rules used by subject might not be believed if identified.
· What makes a bad taxonomy
  - Almost all cases, including important, typical cases, are borderline/unclear cases for the taxonomy
· Traditional paradigms are ill-chosen
  - Mathematical proofs, scientific reasoning: Throughout human history, the overwhelming majority of people have gone through life without engaging in *a single instance* of either of these forms of knowing.
  - Meanwhile, everyone engages in recognitional knowledge all the time.

Consequences of Bad Taxonomy & Paradigms

· The idea that there is a "regress problem".
· Some are tempted to skepticism, because almost none of our beliefs satisfy the paradigms.
· Intuition is viewed as problematic & puzzling.

A New Taxonomy

I. *Noticing* (incl. recognition)
- · Types:
  A. Simple noticing
  B. Subtle noticing
- · Characteristics
  - Immediate/single step. No conscious awareness of any mental processes leading up to the cognition, nor of any other cognition supporting it.
  - Non-volitional: In the case of simple noticing, the cognition arrives automatically and effortlessly. In the case of subtle noticing, the subject exercises an effort to experience the cognition (e.g., *looking for* something, or trying to remember something). In either case, the subject has no choice about what will be noticed (the content of the noticing).
  - The cognition appears to us as merely taking notice of something already available to our awareness. E.g., taking notice of an object in one's field of view.
  - The awareness is categorical. No competing possibilities seem to be present; there are no alternatives to weigh.

II. *Calculation*
- · Note that this can include explicit probabilistic reasoning (as in performing probability calculations).
- · Characteristics
  - Multi-step process, in which later steps seem supported by earlier steps.
  - Usually requires effort to engage process.
  - As in subtle noticing, subject has no control over content. Each individual step is a case of noticing.
  - At each step, nothing needs to be weighed; once it is stated, there is only one thing one can think about that step (without simply suffering from some sort of malfunction).
- · This is the sort of thing that computers can be (easily) programmed to do extremely well.

III. *Judgment*
- · Examples
  - A jury has to weigh evidence. There is some evidence for, and some evidence against the defendant's guilt. Does the evidence go "beyond a reasonable doubt"?
  - Many ethical judgments, e.g.:
    Professor Smith has a dispute with the Young Republicans Club. Smith had agreed to give a lecture for the Young Republicans on Tuesday, for $500. Then, the Socialist Club offered Smith $1000 to give a lecture on that same day. Smith couldn't make both lectures. He informed the Republicans of his desire to accept the Socialist offer. The Republicans offered to match the $1000 if Smith would give his lecture for the Republicans as originally planned. Smith accepted this new agreement and gave the lecture. Afterwards, however, the Republicans paid Smith only $500. Smith sues the Republicans for the remaining $500. Q: Who should win the lawsuit? (*Note:* It is a matter for judgment not only what the ethically correct resolution is, but also what the legally correct resolution is.)
  - Even some perceptual cognition. You see a car in the distance, and wonder: is it going faster than 50 mph, or slower? At some distances, the answer would be obvious. But at some distances, it would be unclear.
- · Characteristics
  - The cognition is equivocal: alternatives must be weighed against each other. More than one thing

can rationally be thought.
- Effortful: Requires effort to engage the process.
- Volitional: subject exercises choice with regard to the content. That is, the subject chooses, to some extent, what will be judged to be so.
- Choice is not arbitrary or 'made in a vacuum', but is based on some prior awareness of the things about which one is judging.
- This prior awareness is generally not discrete: one typically cannot count the number of facts, and much of it is ineffable (can't be expressed in language). Compare digital vs. analog representations. How many pieces of information does a picture express? (This question is easily answered for digital information.)
- Judgment is commonly a borderline case of inference. Numerous facts of which one is aware affect how things seem, and influence one towards one or another conclusion. But the subject does not *cite* these (even to himself) as discrete premises.
- Similarly, one can't say how many steps there are in the process, because the awareness that leads to the judgment doesn't consist of discrete propositions that one can number, or that are considered in sequence. Again, consider the picture example: one doesn't recognize a picture by looking at each of a number of discrete parts in sequence. This doesn't mean that there is just "one step" – your eye may wander over a picture for a while before recognizing the whole thing. It is just that this wandering isn't divided into discrete steps.
· Judgment requires human understanding; computers can't be programmed to do it (although they can sometimes mimic it with sufficiently complicated calculations).

Comments
· This only includes conscious cognition.
· These are idealized types. There can be cases of cognition falling in between calculation and judgment, or noticing and judgment. (But I can't think of anything falling between calculation and noticing.)
- Does this render the taxonomy ill-chosen, because there are many borderline cases? No, because (a) most cases are pretty much in one category or another, (b) the borderline cases are cases that are in between two poles on some dimension.
- By contrast, in the traditional taxonomy, there is a set of characteristics that define each of the categories, where in reality there is basically no correlation among those characteristics (not even the *degree* to which they are instantiated is correlated).

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Unit Review

Know these terms/concepts:
   Skepticism
   Foundationalism, foundational knowledge
   Prima facie justification
   Defeaters
   Phenomenal Conservatism
   Coherentism
     warrant-transfer form
     warrant-emergent
   Cognitively spontaneous beliefs
   Infinitism
   Principle of avoiding circularity
   Principle of avoiding arbitrariness
   Occurrent vs. dispositional beliefs

Know these people's positions:
   Oakley
   BonJour
   Klein
   Huemer

Know these arguments
   Infinite regress argument for foundationalism, or skepticism
   Self-defeat argument for phenomenal conservatism
   Oakley's objection to foundational beliefs:
     & what he thinks perceptual beliefs depend on
     & what he thinks introspective beliefs depend on
   BonJour's & Klein's objection to foundationalism
   BonJour on why coherent beliefs are likely to be true
   Objections to coherentism
     Circular reasoning objection
     Alternate coherent systems
   Klein's objection to coherentism
   Finite mind objection & Klein's response
     incl. how we may have infinite available beliefs

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Notes: Cartesian Skepticism

I. What Is Cartesian Skepticism?

Skepticism: Roughly, any philosophical view according to which some large class of things we normally believe (a) we do not know, or (b) we are not justified in believing.

Varieties:
· *External World Skepticism:* We cannot have knowledge/justified belief about any contingent truths about the external world.
  The external world: That which is independent of one's own mind.
  Contingent truths: Things that could (conceivably) have been otherwise.
· *Global Skepticism:* We cannot have knowledge/justified belief about anything at all.
· In this unit, we consider *external world* skepticism regarding *justified belief.* This is the view that we have no justification for any contingent claims about the external world.

Cartesian Skepticism
· "Cartesian" skeptical arguments involve "skeptical scenarios": scenarios in which
    a) everything appears as it actually does, but
    b) your beliefs are radically mistaken.
· Examples:
  - The dream scenario
  - The deceiving God
  - The brain in a vat

II. How Does Descartes Use Skepticism?

Aim: To identify the foundations for our knowledge. (He also says he wanted to show that knowledge of the soul and of God is the most certain & evident of all knowledge.)

1. The foundations of knowledge must be immune from doubt.
2. Skeptical arguments cast doubt on almost everything:

Argument	Casts doubt on
My senses have deceived me in the past.	Observations made in circumstances where senses have deceived me.
Dream argument.	Present observations of external world.
Deceiving God argument.	Almost everything, but only if I believe in God.
My faculties may be imperfect.	Almost everything. Applies if I don't believe in God.

3. Only propositions about my mind survive, esp.:
   - That I exist.
   - Propositions describing how things *appear* to me.
   - Other propositions describing my present, conscious mental states.
4. Hence, those propositions should form the foundations of knowledge.

· Descartes tries to build up the rest of human knowledge by
   - Proving that God exists, using only premises about the concept of God.
   - Proving that God would not deceive him.
   - Thence concluding that when cognitive faculties are used properly, they are reliable.
   - Thus, all other knowledge rests on knowledge of the soul and of God.
· Almost no one buys those arguments. We will not discuss them here.

III. The Brain-in-a-Vat Argument

1. If you know that P and P entails Q, then you can know that Q. (Premise: Closure Principle for knowledge.)
2. You can't know you're not a BIV. Argument for this:
   a. Our sensory experiences are the only evidence we can have for claims about the external world. (Premise.)
   b. If you were a BIV, you would have the same sort of sensory experiences as you actually have. (Premise.)
   c. Your experiences are not evidence that you're not a BIV. (From b. *Implicit:* If [If A were true, B would be true], then B is not evidence against A.)
   d. You cannot have evidence that you're not a BIV. (From a, c.)
   e. You can't know you're not a BIV. (From d.)
3. Therefore, you don't know (for example) that you have two hands. (From 1, 2.)
   (*Implicit:* Having 2 hands entails not being a BIV.)

· You can substitute "have justification for believing" for "know".
· In the following classes, think about which premise (if any) is denied by each response to skepticism.

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Notes: A Semantic Externalist Response to Skepticism

I. The Concept of Intentionality

Intentionality: The property of being "of" or "about" something; the property of (purportedly) representing something.

Examples: Drawings
Photographs
Words, sentences
Thoughts
Mental images

II. Against Magical Theories of Reference

Magical theories of reference: Theories according to which there are things that represent *intrinsically*.

Physical images don't represent intrinsically:
· The ant/Churchill example

Mental images don't represent intrinsically:
· The space alien / tree-picture example
· The random ink blot example

Words don't represent intrinsically:
· Example of monkeys pounding on typewriter
· Example of person memorizing words without understanding

Combining these points:
· We can imagine a person who has
    a) Tree-like mental images
    b) Mental "words" that are just like words used to describe trees in some language
    c) A "feeling of understanding"
    d) but yet no thoughts genuinely about trees.
· So even mental states don't intrinsically represent.

III. The Causal Theory of Reference

For *x* to refer to *y*, there must be an appropriate (close) causal connection between *x* and *y*, or between *x* and some things in terms of which *y* can be described.

The Twin Earth Example:
· Chemical XYZ on Twin Earth looks, tastes, etc., exactly like water.
1. When people on Earth say "water", they refer to H_2O.
2. When people on Twin Earth say "water", they refer to XYZ.
3. Therefore, the "meaning" or "intentional content" of their "water" thoughts differs. (From 1, 2)
4. The mental states of people on Twin Earth are intrinsically indistinguishable from those of people on Earth.
5. Therefore, meaning/content is not determined by intrinsic properties of mental states. (From 3,4)

What differs between Earth and Twin Earth? The *causes* of their mental states.

Conclusion: Reference is determined by causal relations.

IV. Why the BIV Scenario Is Self-Refuting

1. One cannot talk/think about *x*'s if one has no appropriate causal connections to *x*'s, or to things in terms of which they can be described. (Premise - Causal Theory of Reference.)
2. The BIV has no appropriate causal connections to brains, nor to anything in terms of which they can be described. (Premise.)
3. So the BIV cannot talk/think about brains in vats. (From 1, 2.)
4. So, if anyone entertains the BIV hypothesis, that person is not a BIV. (From 3.)
5. We're entertaining the BIV hypothesis. (Premise.)
6. So we're not BIV's. (From 4, 5.)

Alternately:

7. When a non-BIV says, "I'm not a BIV," what he says is true.
8. When a BIV says, "I'm not a BIV," what he says is also true. (See why.)
9. Therefore, "I'm not a BIV" is true. (From 7, 8.)
10. "I'm not a BIV" (said by me) is true if and only if I'm not a BIV.
11. I'm not a BIV. (From 9, 10.)

V. Possible Replies

A. Reject the causal theory (Searle)
B. Putnam only addresses some versions of skeptical scenario

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Notes: The Relevant Alternatives Response to Skepticism

I. Brain in a Vat Argument, Traditional Formulation

1. If S knows that P and [/S knows that] P entails Q, then S knows [/is in a position to know] Q. (*Closure Principle* for Knowledge)
2. I don't know [/am not in a position to know] that I am not a BIV.
3. I don't know that I have a body. (From 1, 2.)

Dretske rejects (1).

II. Dretske's Account of Knowledge

"Know" is an absolute term:
· There are no degrees of knowledge.
· Inconclusive reasons are insufficient for knowledge.
The Lottery example: You have a ticket in a lottery, in which one of a large number of tickets is going to be selected at random as the winner. Do you *know* that your ticket is going to lose?

    a) If there are 100 tickets?
    b) If there are 1 million tickets?
    c) If there are 1 billion tickets?

Intuitive response: No. Conclusion: no grounds short of *conclusive* grounds are sufficient for knowing.

A problem with absolute terms:
· They threaten to be empty.
· Examples:
  - Maybe nothing is really flat. (Because a flat surface must have *no* bumps *at all*.)
  - Maybe no container is ever empty. (An empty container must have *nothing* in it.)
  - Maybe no one really knows anything. (If S knows that *p*, there must be *no alternative possibility* that S can't rule out.)

"Relationally Absolute" terms:
· *Flat:* has no bumps *of the relevant kind.*
· *Empty:* contains no *relevant* objects.
· *S knows p:* S's evidence eliminates all *relevant* alternatives to *p*.
  - "Eliminate": To eliminate an alternative, you must have evidence good enough for *knowing* that it does not obtain. [*Note:* If this was supposed to be an analysis of knowledge, it is now circular.]
  - "Alternatives": Propositions logically incompatible with *p*.
  - Important: the *relevant* alternatives are not all the *logically possible* alternatives. The "relevancy set" is smaller than the "contrasting set".
· The "no" and "all" words indicate the absoluteness.
· But the "relevant" kinds are context-dependent.

What determines the relevant alternatives?
  One important factor: When a possibility is *too remote* to be relevant.
· This is a matter of "the kind of possibilities that actually exist in the objective situation." (549)
· I.e., if something is objectively impossible, it is irrelevant.

The Siberian Grebe Example
  · The bird watcher sees a Gadwall duck in the water and correctly identifies it as such.
  · Siberian Grebes are a species that look just like Gadwall ducks when in the water.
  · Does the bird watcher know it is a Gadwall . . .
      a. If there are actually Siberian Grebes in the vicinity?
      b. If there are no Siberian Grebes around, but they *could have* flown to the area?
      c. If the Siberian Grebes are restricted to Siberia?
      d. If Siberian Grebes are purely imaginary?
  · Dretske says: No in (a) and (b), yes in (c) and (d).

The Zebra Example (from a different paper by Dretske)
  · You see some zebras in the zoo. (a) Do you know they're zebras? (b) Do you know they're not cleverly disguised mules?
  · Dretske says: Yes to (a). No to (b). Cleverly disguised mules are not a relevant alternative.
  · Why no to (b)?
    - No evidence against disguised-mule hypothesis.
    - The evidence for their being zebras doesn't count against their being disguised mules.

III. The Problem with Skepticism

  · The skeptic's alternatives are not relevant. They aren't real possibilities.
  · The Closure Principle is false. This follows from the RA account of knowledge:
    1. Suppose i is an irrelevant alternative to p.
    2. I can know that p even though my evidence doesn't eliminate i. (From 1, def. of "irrelevant alternative".)
    3. So I can know that p even though I can't know that $\neg i$. (From 2 + def. of "elimination".)
    4. p entails $\neg i$. (From 1, def. of "alternative".)
    5. So Closure Pr. is false. (From 3, 4.)

Phil. 4340
Notes: Klein's Response to Skepticism

I. Overview

The Skeptical Argument
1. If S has justification for P and P entails Q, then S has justification for Q.
2. You have no justification for ~BIV.
3. Therefore, you have no justification for believing you have hands, etc.

- Dretske says (1) is false.
- Klein will argue: either Dretske is right, or the skeptic's argument "virtually begs the question".

II. How the Closure Principle Could Be Defended

- Closure Principle for Justification:
    (Jsp & p⊢q) ⊃ Jsq
- Two reasons why this might be true:
    a) When eJp & p⊢q, then eJq. (The evidence that justifies p also justifies q.)
       - Klein calls this "the mistaken target".
    b) When Jp & p⊢q, then pJq. (p itself justifies q.)
       - Klein refers to p as an "internally situated reason"–this is a reason that comes from S's existing beliefs.
- Recall Dretske's Zebra example. D says:
    - You have evidence that (Z) "the animals are zebras".
    - This evidence does not count against (M) "they are cleverly disguised mules".
    - This refutes (a).
- But Dretske does not refute (b).
- To defend Closure, the skeptic must adopt (b).
- (b) is plausible anyway.

III. The Skeptic's Main Argument Becomes Useless

· Skeptic now says:
   1. (Jp & p⊢q) ⊃ pJq.
   2. You have no justification for ~BIV.
   3. Therefore, you have no justification for believing you have hands, etc.
· But from (1), if you had justification for "I have hands", then this would provide justification for "~BIV".
· To show that (2) is true, you must first show ~J(I have hands).
· ∴ To establish premise (2), you must already have an argument sufficient for establishing conclusion (3).
· *Virtually begging the question:* This is the error an argument makes when one of the premises cannot be established unless one already has an independent argument for the conclusion.

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Notes: Easy Responses to Skepticism

Is Skepticism Self-Defeating?

· A self-defeating statement: "I know that I know nothing".
  - Skeptic does not say that.
· "No one is justified in believing anything (not even this)."
  - This is self-defeating.
  - *Global* skepticism about justification entails this.
  - Cartesian skepticism does not.
· Perhaps skeptic could not possess the concepts he uses, if skepticism were true.
  - Concept of a brain, vat, etc.
  - This would make the view self-defeating.

Is Skepticism Dishonest?

· Why don't skeptics walk in front of trucks? Perhaps skeptics are insincere.
· This fails to explain what is wrong with skeptical arguments.
· It also fails to refute them. A hypocrite could say something true.

Moorean Response

· Let *s* be some skeptical premise (possibly conjunctive). Let k be some ordinary knowledge claim ("I know this is a hand", etc.)
· Consider two arguments:

Skeptic:	Moore:
s	k
$\therefore \neg k$	$\therefore \neg s$

Which is better?
  · Both equally valid.
  · Both equally circular or non-circular.
  · Which has the more plausible premise? Moore says *k* is more obvious than *s*.
  · So it would be irrational to accept the Skeptic's argument, rather than Moore's.
  · Applies to all skeptical arguments.

Moore's Proof of an External World

1. Here is one hand (said while holding up and waving a hand).
2. Here is another (said while demonstrating the other hand).
   (Implicit premise: hands are external objects.)
3. Therefore, there are external objects.

Comments:
· Conditions for an argument to be a proof:
   a. Premises are known to be true.
   b. Premises entail the conclusion.
   c. The argument does not beg the question.

All of these conditions are satisfied by Moore's "proof", so it is a proof.

· Does Moore beg the question?
  - Skeptics would be unconvinced. This does not show that the argument is defective; maybe skeptics are irrational.
  - The conclusion is not contained in the premises (unless all conclusions of deductive arguments are "contained" in the premises).
  - Some would say: Moore begs the question because he uses a method of knowing (the senses) that skeptics are calling into question.
· Other arguments of this kind are accepted as proofs. Ex.:
  - Someone wants to know whether space aliens exist. You bring in an actual space alien for examination. You have then "proved the existence of aliens".
  - Someone wants to know whether there are at least three typos on a page. You point to parts of the page, saying, "Here's a typo ... here's a typo ... and here's a typo." If there are typos in all three places, then you *proved* that there were at least 3 typos on the page.
  - There is nothing wrong with these inferences. Moore's argument is of the same kind. So (?) there is nothing wrong with his argument.

Phil. 4340
Notes: A Direct Realist Response to Skepticism

I. Review of Dretske's and Klein's responses

- Skeptic says: "BIV Hypothesis is an alternative to Real World Hypothesis. You can't rule out BIVH. So you don't know RWH."
- Dretske: "I can't rule out BIVH, but I still know RWH. BIVH is irrelevant (because not objectively possible)."
- Klein: "Maybe you can defend the closure principle, but then your claim that I can't rule out BIVH begs the question."

II. What Is Wrong with these Responses

The Courtroom Example

S is on trial for murder. The prosecution offers as evidence the fact that S's blood was found at the scene of the crime along with the victim's blood. They suggest that S got cut while stabbing the victim. The defense offers an alternative hypothesis: S is innocent, and the blood was planted at the crime scene by the police, seeking to frame S.

Dretske: For all we know, the defense is correct, and S was framed by the police. But anyway, we still know S is guilty.

Klein: Either Dretske is right, or the defense attorney's argument just begs the question, because if we know S is guilty, we can infer that he wasn't merely framed.

The Scientific Case

Physicist A supports the Copenhagen Interpretation of quantum mechanics. Physicist B supports Bohm's Interpretation. Both interpretations explain all the same data, but they are incompatible with each other. B says we shouldn't accept the Copenhagen Interpretation because Bohm's interpretation might be right.

Dretske: I don't know whether Bohm's theory is right. But I know the Copenhagen theory is right.
Klein: Dretske is right, or Physicist B is begging the question.

Intuitively, the Dretske & Klein responses in both cases are wrong, and the "skeptical" scenario needs to be addressed.

III. A Reformulation of the Argument & the DR Response

1. If H_1 and H_2 are competing explanations of some evidence, E, then S is justified in believing H_1 on the basis of E only if S has independent grounds for rejecting H_2. (Preference Principle)
2. The BIV Hypothesis and the Real World Hypothesis are competing explanations of our sensory experience.
3. So to be justified in believing RWH on the basis of our sensory experience, we must have independent grounds for rejecting BIVH. (From 1, 2.)
4. We have no such grounds.
5. Therefore, we are not justified in believing RWH on the basis of our sensory experience. (From 3, 4.)
6. Facts about sensory experience are the only justification we might have for RWH.
7. So we're not justified in believing RWH. (From 5, 6.)

Notes:
- This argument escapes Klein's and Dretske's responses, as it should.
- But it assumes indirect realism.
- On a direct realist view, (6) is false. We might be *foundationally* justified in believing RWH, or we might be justified in believing RWH on the basis of facts about *the physical world*.
- (4) may also be false. Facts about the physical world (of which we're directly aware) might be grounds for preferring RWH over BIVH.
- Main point: for the IRist, our "evidence" is facts about *experiences*. BIVH and RWH are alternate explanations of this evidence. For the DRist, our "evidence" is facts about *physical reality*. BIVH completely fails to explain *that* evidence.

IV. Objections

(i) Does DR imply that perceptual beliefs are indefeasible?

No. See concept of "prima facie justification": perceptual beliefs are "presumed innocent until proven guilty," i.e., justified as long as there are no positive grounds for doubt.

(ii) Does the DR response 'beg the question'?

Two kinds of responses to skepticism:

- *Aggressive response:* A positive argument, addressed to the skeptic, that we have knowledge of the external world.
  - We have not provided one of these.

- *Defensive response:* A *response* to the skeptic's argument that we don't have knowledge of the external world.
  - We *have* provided one of these.

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Unit Review

Know these terms/concepts:
    Skepticism
      External world vs. global
      Cartesian
    Intentionality
      "Magical" theory
      Causal theory
    Absolute terms
    Relationally absolute terms
    Relevant alternatives
    Closure principle
    Virtually begging the question
    Preference principle

Know these people's views:
    Descartes
    Moore
    Putnam
    Dretske
    Klein
    Huemer

Know these examples & what they support:
    Twin Earth (Putnam)
    Alien tree-picture example (Putnam)
    The zebras in the zoo (Dretske)
    Siberian Grebes (Dretske)
    Courtroom & scientific cases (Huemer)

Know these arguments:
    Descartes' argument establishing the foundations of knowledge
    BIV argument
      traditional formulation
      Dretske's response
      Klein's response
      Huemer's formulation
      Huemer's response
    Moore's general response to skepticism
      & why his argument is better than Skeptic's
    Moore's proof of an external world
      & his three conditions for a genuine proof
    Putnam's argument against BIV hypothesis

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Notes: A Priori Knowledge, Introduction

Important Concepts:

I. Analytic vs. Synthetic: *some definitions*

a) A *judgement* is analytic iff the concept of the predicate is contained in the concept of the subject. (Kant's definition)
b) A *sentence* is analytic iff it is true by virtue of the meanings (or, definitions) of the terms contained in it.
c) A *sentence* is analytic iff understanding of the sentence entails being in a position to know that it is true.
c) (Best definition): A sentence S is analytic iff the negation of S can be transformed into a formal contradiction by substitution of synonymous expressions and formally valid inferences. (Or: iff S can be transformed into a logical truth by substitution of synonymous expressions and formally valid inferences.) (Frege's definition)
• *Synthetic:* Not analytic.

II. Empirical vs. A Priori

• *Empirical:* S knows that P empirically = S knows that P, and S's justification for P essentially involves observation.
  - *Observation:* sensory perception or introspection. (On my view: a belief whose justification is directly conferred by a sensory or introspective appearance.)
  - *"Essentially involves observation":* an observation is a necessary part of the justification; if the observation is removed, then the belief is no longer justified.
• *A priori:* S knows a priori that P = S knows that P, not empirically.
  - *Possible kinds of a priori kn.:*
    1. Innate knowledge.
    2. Knowledge acquired through non-observational faculties (reason/intuition).

III. Necessary vs. Contingent

• *Necessary:* Could not have been otherwise.
• *Contingent:* Could have been the case, and also could have not been the case. Neither necessary nor impossible.

Notes:
1. "Analytic"/"synthetic" applies to *sentences* or *judgements*.
   "Empirical"/"a priori" applies to *knowledge* or *justification*.
   "Necessary"/"contingent" applies to *propositions*
2. "Analytic"/"synthetic" is a *logical/semantic* distinction.
   "Empirical"/"a priori" is an *epistemological* distinction.
   "Necessary"/"contingent" is a *metaphysical* distinction.

IV. Empiricism vs. Rationalism

- *Empiricism:*
    1. Motivating idea: All knowledge of objective reality is empirical.
    2. Modern interpretation: No synthetic a priori knowledge.
    3. The role of reason: Constructs inferences from inputs provided by observation.

- *Rationalism:*
    1. There is a priori knowledge of objective reality.
    2. There is synthetic a priori knowledge.
    3. The role of reason: (a) operates on information provided by observation, and (b) provides some inputs of its own.

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Notes: Kant on Synthetic A Priori Knowledge

I. Kant: Main ideas

1. *There is synthetic, a priori knowledge.*
   - Arithmetic: 5+7=12.
     "The concept of the sum of 7 and 5 contains nothing save the union of the two numbers into one, and in this no thought is being taken as to what that single number may be which combines both. The concept of 12 is by no means already thought in merely thinking this union of 7 and 5..." (B15)
   - Geometry: The shortest path between two points is a straight line.
     "For my concept of *straight* contains nothing of quantity, but only of quality." (B16)
   - Physics: In all changes of the material world the quantity of matter remains unchanged.
     "For in the concept of matter I do not think its permanence, but only its presence in the space which it occupies." (B18)

2. *Knowledge of these things depends upon "intuition", and not merely abstract concepts.*
   - *Intuition:* direct awareness (or representation) of particular objects. Incl. perception, introspection, imagination. (B33) [*Do not confuse* with contemporary philosophical usage!]
   - Geometrical proofs depend essentially upon use of figures. These need not be real, physical figures, but may be merely imagined. Thus, it involves "intuition" of space.
   - Arithmetical knowledge depends upon imagining changes in time, e.g., successive additions of units. Thus, it involves "intuition" of time.

3. *Synthetic, a priori knowledge is a big mystery. If it pertained to objective reality, it would be impossible.* Rejects traditional rationalism (à la Descartes, Spinoza, Leibniz).
   "If intuition must conform to the constitution of the objects, I do not see how we could know anything of the latter a priori; but if the object (as object of the senses) must conform to the constitution of our faculty of intuition, I have no difficulty in conceiving such a possibility." (Bxvii)

4. *How synthetic a priori knowledge is possible:*
   - Pertains to the *form of intuition*. Does not pertain to the objective world.
   - Space is "the form of outer intuition."
     An artefact of our way of representing external objects. Space does not exist objectively. Rejects both absolutist & relational accounts of space.

     "It is, therefore, solely from the human standpoint that we can speak of space, of extended things, etc. ... The proposition, that all things are side by side in space, is valid under the limitation that these things are viewed as objects of our sensible intuition. If, now, I add the condition to the concept, and say that all things, as outer appearances, are side by side in space, the rule is valid universally and without limitation." (Kant, B42-3)

   - Time is "the form of inner intuition."
     An artefact of our way of representing ourselves (mental processes). Time also does not exist objectively.
   - The mind imposes these forms on everything that it represents. Analogy: the green glasses.

5. Kantian subjectivism:
  • Hence, we know that all possible objects of experience must satisfy the synth a priori principles.
  • But these principles do *not* apply to "things as they are in themselves."
  • Also, we have no awareness of "things-in-themselves" ("noumena").

II. Comparison between Locke & Kant:

Locke on secondary qualities:
- In the object: unknown primary qualities.
- In us: sensation of red.
- The unknown primary qualities in the object have a disposition to cause the sensation of red.
- People often confuse the sensation with a property of the object.

Kant on primary qualities:
- In the thing-in-itself: unknown properties.
- In us: perceptions of shapes.
- Unknown thing-in-itself properties cause (?) perceptions of shapes.
- People confuse shapes with properties of things-in-themselves.

III. Weird Things about Kant

- *His causal subjectivism:* In Kant's view, causation is not an objective phenomenon either. So 'things in themselves' can't really *cause* appearances. Possible reply: Maybe there is some broader *dependence* relation, not exactly causation.
- *His psychological subjectivism:* Locke's view about secondary qualities makes sense because he has *something else* of which we are more directly aware (our own 'ideas'). Kant denies that we are directly aware even of our own minds (the 'noumenal self' is inaccessible). Hard to understand the appearance/reality distinction on this view.
- *Weird views about time:* Unclear how time is any more a form of inner intuition than of outer intuition. Unclear how arithmetic is about time. Hypothesis: Kant liked symmetry too much.
- Not that clear what the big problem of synthetic a priori knowledge is.
- See Russell's criticisms (later).

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Notes: (Il)logical positivism

I. Basic Concepts

- *Empiricism :* There is no synthetic, a priori knowledge. (Hume, Berkeley, perhaps Aristotle)
- *Verificationism :* The (cognitive) meaning of a statement is given by the conditions under which it would be verified or refuted. Corollary: If it cannot, in principle, be known whether S is true or false, then S is "meaningless".
- *Logical Positivism :* empiricism + verificationism ⇒ 2 (or 3) kinds of meaningful sentences:
    a) Analytic (or contradictory) sentences: These are true (or false) in virtue of the meanings of words; "verified" by all (or no) possible experience.
    b) Contingent & empirically testable sentences. Verified by some experiences, refuted by others.

  Comments:
    - Practical vs. in-principle verifiability. (Should use in-principle verifiability.)
    - Strong vs. weak sense of "verifiable". (Should use weak sense.)
        - Strong: 100% conclusive verification.
        - Weak: Some evidence in its favor.
    - The meaning of "meaningless". Fails to assert a proposition, not truth-apt.
        - Distinguish: Cognitive meaning vs. 'emotive meaning'.

II. The Implications of Positivism

1. Mathematics: Analytic. Says nothing about reality. Leads to formalist philosophy of mathematics.
2. Logic: Like mathematics.
3. Ethics: meaningless. Leads to non-cognitivism.
4. Religion: meaningless.
5. Metaphysics: meaningless.
6. Philosophy: Only legitimate function is to clarify language usage.

III. Arguments for positivism

IV. Objections

1. How is the verification criterion known? (Is it self-defeating?)
2. Positivists confuse metaphysics with epistemology, truth with justification. There can be facts we can't know. Why can't there be statements such that we can't know whether they are true?
3. Sentence meanings are compositional. The meaning of a sentence is determined by whether the individual words are meaningful & combined in an appropriate way. There is no guarantee that such combinations will always turn out to be verifiable. (Invisible turtle example.)
4. Examples of unknowable things:
    - What happened before the Big Bang.
    - How many hairs were on Aristotle's head on his 35th birthday.
    - Religious claims.

5. There are many examples of synthetic, a priori knowledge.
    • Mathematics.
    • Ethics.
    • Metaphysics.
    • Miscellaneous other a priori knowledge, often neglected by philosophers:
        "Nothing can be both completely red and completely blue."
        "If a person wants to do A, knows that he can do A, and has no reasons to refrain from A, then he will do A."
        "If A is inside B, and B is inside C, then A is inside C."
6. Circularity: How do you know whether S is "verified" by an observation or not? Must understand the meaning to know what verifies/fails to verify it.

V. The History of Positivism

1. Motivations for positivism:
    • Scientism: worship of science & mathematics; disparagement of other intellectual endeavors.
    • Positivists seek a blanket way to dismiss all work in metaphysics. Hence the verification criterion.
    • It is fun to sound "hard-headed".
    • Heavily influenced by Hume.
2. Verificationism becomes early 20th-century dogma, almost universal in analytic philosophy. They did not feel the need of arguments for it.
3. Leads to acceptance of all the implications under (II) above.
4. Scientists are brought into this credo, esp. hard scientists.
5. Scientists & mathematicians develop positivist-inspired theories (relativity, quantum mechanics, non-euclidean geometry).
6. Most philosophers later reject the verification criterion (while holding on to empiricism). Scientists, however, still maintain it.
7. The implications of positivism, under (3) and (5), remain accepted orthodoxy.
8. The orthodox theories are now used to argue for empiricism ("science has shown that positivism is true").

Lessons:
    • Philosophical fashions come and go. Cases in point: (a) scholasticism, (b) 19th century idealism, (c) illogical positivism.
    • Beware scientism.

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Notes: Radical Empiricism (Quine)

I. Quine's Basic Views

- All knowledge is empirical.
- There is no analytic/synthetic distinction.
- Belief revision:
  - Confirmation holism: individual beliefs cannot be tested. Only the whole belief system can.

II. The Two Dogmas of Empiricism

1. The analytic/synthetic distinction
   - Note distinction between meaning (or "sense") and reference
   - Analytic sentences: can be transformed into logical truths by substituting synonymous expressions.
2. Reductionism: "the belief that each meaningful statement is equivalent to some logical construct upon terms which refer to immediate experience."

III. Against Analyticity

A. Problem: What is "synonymy"?
Ways of explaining synonymy + problems with them:

1. Sameness of meaning:
- Problem: "meanings" are "obscure", "elusive" entities, like ideas or Platonic objects. "[N]ow we have abandoned the thought of a special realm of entities called meanings."
- Meanings probably won't be helpful anyway. (?) "If a standard of synonymy should be arrived at, we may reasonably expect that the appeal to meanings as entities will not have played a very useful part in the enterprise."

2. Appeal to "definition":
- Problem: This is backwards. Definition depends on views of synonymy.

3. Interchangeability: can be interchanged in all contexts without changing truth value
- Problem: consider

  "I have a bachelor of arts." (Try substituting "unmarried man".)
  "'Bachelor' has less than 10 letters."

- Reply: treat "bachelor of arts" and "'bachelor'" as different words.
- New problem:

  (4)   "Necessarily, all and only bachelors are bachelors."
  (5)   "Necessarily, all and only bachelors are unmarried men."

  According to the criterion, "bachelor" is synonymous with "unmarried man" only if (5) is true. But we can't determine whether (5) is true unless we first know whether it is analytic that "all bachelors are unmarried."
- Suppose we have a language without words like "necessarily." Then interchangeability is not sufficient for synonymy. Example: "creature with a heart" and "creature with a kidney"

4. Semantical rules. [Skip this part.]

5. *Verification criterion:*
   - "statements are synonymous if and only if they are alike in point of method of empirical confirmation or infirmation."
   - From this you can derive a concept of synonymy for words.
   - Problem: See IV below.

B. *The argument from difficult cases:*
   "I do not know whether the statement 'Everything green is extended' is analytic."

IV. Against Reductionism

- *Radical Reductionism:* All statements can be translated into statements about immediate experience.
  - Carnap attempted to show how this could be done.
  - Problem: no way of translating "quality q is at <x, y, z, t>." (Statements about physical objects *entail* nothing about experiences, and vice versa.)

- *Weaker form of reductionism:* Every statement has a unique set of experiences that would increase its probability ("confirm" it), and a unique set that would decrease its probability ("infirm" it).
  - Objection: "Our statements about the external world face the tribunal of sense experience not individually but only as a corporate body." "The unit of empirical significance is the whole of science." [This view is called *Confirmation Holism.*]
  - Related: Any belief can be maintained in the face of any evidence.
  - The metaphor of the 'web of belief': we have a network of beliefs.
    - The web as a whole implies predictions about experience.
    - If a prediction is false, *something* in the belief system has to be changed.
    - People are *more willing* to give up some statements than others.
      - Statements near the edge are 'closer to experience'. People are more willing to give them up in the face of surprising experiences.
      - Statements near the center are farther removed from experience and called 'analytic'. People are less willing to give them up.
      - The choice of what to give up is pragmatic: "Conservatism figures in such choices, and so does the quest for simplicity."
    - No dividing line between analytic & synthetic.
    - Laws of logic are just more statements in the system. Laws of logic could be revised. (See quantum mechanics.)
    - Physical objects "are posits which serve merely to simplify our treatment of experience . . . their incorporation into the theory enables us to get more easily from one statement about experience to another."
  - Example: how to test Newton's theory of gravity?

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Notes: Traditional Rationalism

I. Review: Catalog of Main Views

	Synthetic, a priori knowledge?	A priori knowledge of objective facts?	Analytic knowledge?	Synth a priori statements meaningful?
Traditional Rationalism	✓	✓	✓	✓
Traditional Empiricism			✓	✓
Kant	✓		✓	✓
Positivism			✓	
Quine				?

II. Russell's Rationalism

- A distinction:
  Universals: May be predicted of other things. May be "shared" by multiple things at once.
  Particulars: Ultimate subject; cannot be predicated. Can only be in one place at a time.

- Another distinction:
  - Knowledge by *description* :
    - ✦ Awareness of an object by virtue of an identifying description; the object is the unique thing satisfying the description.
    - ✦ Identification works by the object's relation to something else
    - ✦ Examples: particular physical objects. "the tallest man in the world"
  - Knowledge by *acquaintance* :
    - ✦ That which is not by description; direct awareness of an object.
    - ✦ Note: "acquaintance" *not* a causal or perceptual notion
    - ✦ Note: This is 'knowing' an object, not knowing a proposition
    - ✦ Examples: sense data, universals

- All awareness depends on acquaintance. (infinite regress argument)

- Moreover: awareness by description depends on awareness of universals.

- Hence, we have acquaintance with (at least some) universals. This is known as "grasping" a universal. Examples:
  - Known by description: The 400th prime number
  - Known by acquaintance: 2

- Acquaintance w/ universals leads to judgement of relations between universals

- Russell's conception of a priori knowledge:
  A priori knowledge is (or derives from) knowledge of the properties and relations of universals.
  - Examples:
      "All triangles have 3 sides."

"All red things are extended."
"No red thing is also blue."
"'inside of' is a transitive relation."
"2 + 2 = 4."

   - Notice that the theory accounts for both analytic & synthetic knowledge in the same way.

III. Do Universals Exist? Some Trivial Arguments

A) Yellow exists.
1. The following is a true statement:
    (Y) Yellow is a color.
2. The truth of (Y) entails that yellow exists.
    a. (Y) is a statement of the form ⌜a is F⌝.
    b. The truth-conditions for a statement of the form ⌜a is F⌝ are: that ⌜a⌝ refer to something, and that ⌜F⌝ apply to that thing.
    c. If "yellow" refers to something, it refers to yellow.
3. So yellow exists.

B) Yellow is a universal.
1. A universal is something that many particulars can have in common.
2. The sun, lemons, and school buses are yellow.
3. So many particulars have yellowness in common. (From 2)
4. So yellow is a universal. (From 1, 3)

C) Universals are not "subjective." Universals are not words or ideas in the mind.
1. Yellow is a property of lemons.
2. No word or idea is a property of lemons.
3. So yellow is not a word or idea.

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Bonus Material: Empiricism & Scientism in Modern Culture

I. Intellectual History & the Empiricist Interpretation

- Philosophy from ancient Greece to the Enlightenment:
  - No distinction between science & philosophy. What we call natural science was called "natural philosophy" or "philosophy of nature".
  - Many false theories, incl. in natural philosophy:
    - Aristotle's physics
    - Theory of 4 elements
    - Theory of 4 bodily humors
    - Ptolemaic astronomy
    - Natural teleology
  - Medieval philosophy: Many appeal-to-authority arguments.
- The new science: 16th century & after
  - Copernican/Keplerian astronomy
  - Newtonian & Galilean revolution in physics
  - Physics becomes much more mathematical, practically useful, and epistemically secure
  - 20th Century: Theory of relativity, quantum mechanics
- The empiricist interpretation:
  - The enlightenment:
    - Medieval philosophy went wrong because it relied upon intuition & authority. Also, we were egotistical (Ptolemaic astronomy).
    - Intellectual progress occurred in the Enlightenment because we started to rely solely on observation and reject intuition & authority.
    - We also discovered that human beings are insignificant (Copernican astronomy).
  - The 20th century:
    - Scientists reluctantly gave up cherished intuitions because they were refuted by the Theory of Relativity and Quantum Mechanics.
    - Relativity and QM are conclusively proved purely by sensory observations.
    - Relativity shows that there is no objective time order to events; the size, shape, mass, etc., of objects is relative to an observer; and other "counterintuitive" things.
    - Quantum mechanics refutes logic by showing that an object can be neither A nor non-A but "indeterminate". It also shows that there are irreducibly random events.
    - Each of these things further prove that "intuitions" are unreliable and knowledge can only come purely from the five senses.
  - Science brought enormous benefits for humanity & advances in understanding.

II. The Ideology of Scientism

- An exaggerated respect for science, i.e., physical & biological science.
- Anything that isn't science is worthless.
- All philosophical views are chosen:
  a. To express worship for "science" (i.e., a certain simplistic caricature of what science is), or
  b. To adhere to the spirit of the substantive discoveries of modern scientists (or rather, to the simplistic caricature of those discoveries accepted by victims of scientism).
- Philosophical views:

- *Epistemology:* All knowledge is purely empirical.
- *Metaphysics & Philosophy of Mind:*
  - Only the physical exists.
  - No free will. (Alternately: compatibilism.)
  - Consciousness either doesn't exist or is really just brain states and/or behavior.
  - No god, souls, etc.
  - There are no universals.
  - People are just temporary globs of particles (or spacetime worms). Boundaries of "the same person" are arbitrary and meaningless.
- *Ethics:*
  - There are no moral properties. Either nothing is wrong, or "wrong" just means "we don't like it."

III. Intellectual History: What Really Happened

- Enlightenment:
  - Philosophers long knew that observation was necessary. Aristotle was an empiricist.
  - Conceptual, a priori advances (mathematical formulation of scientific theories) made possible more precise empirical predictions → suggested observations to make that would not otherwise have occurred to people.
- Modern scientific method: People learned about miscellaneous sources of error, and ways to combat them:
  - Confirmation bias, incl. tendency to remember only confirmatory evidence
  - Biased interpretation of observations / need for double blind studies
  - Possibility of confounds / need for controls
  - Placebo effect
  - Need for large samples (advancements of probability theory)
  - Regression to the mean
- Late 19th - early 20th century:
  - Atmosphere of science-worship, due to scientific successes over past 2 centuries.
  - Scientism takes over in philosophy, leading to logical positivism
  - Philosophers teach logical positivism to scientists
- 20th century:
  - Einstein uses positivist ideology to motivate relativity
    - Devises a priori argument against absolute simultaneity (*Relativity*, chs. 8-9, http://www.bartleby.com/173/).
    - There can't be a preferred reference frame, because it can't be observationally identified.
    - Also, it's simpler to say there is no preferred reference frame.
    - Also rejects Euclidean geometry
  - Quantum theorists use positivist ideology to motivate preferred interpretations of quantum mechanics.
    - Bohm's interpretation of QM is logically coherent and avoids all the absurd implications of QM.
    - But this doesn't matter because "intuitions" can't be trusted.
    - Also, Bohm's theory is incompatible with relativity.
  - People who don't know the basis of either theory then (a) accept both theories on the basis of authority, and (b) claim the theories as evidence for the truth of positivism.

IV. The Absurdity of Scientism

- Epistemic hypocrisy:
  - Empiricists make two a priori assumptions: (a) that there is no a priori knowledge, (b) that simpler theories are more likely to be true. These are pure articles of faith.
  - They also accept scientific theories on the basis of authority.
  - They accept and reject philosophical theories based on emotion, e.g., the claim that some philosophical view is "weird".
- Absurd beliefs
  - Denial of consciousness
  - Denial of free will
  - Denial of moral properties
  - Denial of universals
  - Reinterpretation of mathematics
  - Why is it irrational to believe these things?
    - Each of these things seems utterly obviously false on its face
    - It seemed that way to almost everyone in virtually every society throughout human history
    - All of them are motivated by empiricist & scientistic ideology

Phil. 4340
Unit Review

Know these concepts & distinctions:
    analytic vs. synthetic
    a priori vs. empirical
    universals / particulars
    acquaintance / description

Know what these positions are:
    Empiricism
    Rationalism
    Kantianism
    Positivism
    Verificationism

More on Kant's ideas:
    What sort of things he considers synthetic
        a priori
    Roughly how he thinks it is possible
    Implication for knowledge of 'things in
        themselves'

More on positivism:
    Positivist view of:
        Math
        Logic
        Ethics
        Metaphysics
        Philosophy in general
    3 kinds of meaningful sentences
    Objections, esp.:
        The self-refutation problem
        The circularity objection

Quine:
    The 'two dogmas'
    Confirmation holism
    His view of: synonymy, meanings,
        analyticity
    What's wrong w/ verification criterion of
        meaning
    Web of belief: difference between 'analytic'
        & 'empirical' statements
    How we choose which beliefs to revise

Russell's rationalism:
    His view of universals
    What we are acquainted with
    Relation btw. universals & a priori kn.
    Argument for why we must have
        acquaintance w/ universals.

Phil. 4340
Notes: The Problem of Induction (David Hume)

Important Concepts

Nondemonstrative inference: An inference in which the premises are held to support the conclusion but are not held to entail the conclusion.

Inductive inference: A kind of non-demonstrative inference in which the premises attribute a certain property to a certain class of things, and the conclusion attributes that property to a different or larger class of things. Ex:

> All observed cats have been furry. The sun has always risen in the past.
> Therefore (probably), all cats are furry. Therefore (probably), it will rise tomorrow.

Relations of ideas: (in Hume) Propositions that are true by virtue of the relationships between concepts; propositions that are both analytic and knowable a priori. [Does this include contradictory propositions?]

Matters of fact: (in Hume) Propositions that are true or false by virtue of the facts independent of our ideas; propositions that are synthetic and *not* knowable a priori.

Cogent vs. *Valid* & *Confirm* vs. *Entail:* 'Cogent' arguments have premises that confirm (render probable) their conclusions. 'Valid' arguments have premises that entail their conclusions.

Hume's Thesis

- Actual view: Conclusions based on induction are not the product of reason. Instead, they are the product of 'custom'.
- Usual interpretation of Hume: Inductive skepticism (see below).

An Argument for Inductive Skepticism

1. All justified beliefs fall into one of three categories:
   a) Relations of ideas,
   b) Observations,
   c) Conclusions based on induction. (Premise.)
2. All inductive inference presupposes the Uniformity Principle (UP). (Premise.)

   UP   The future will resemble the past, or
        Unobserved objects are similar to observed objects.

3. Therefore, conclusions based on induction are justified only if the UP is justified. (From 2.)
4. The UP is not a relation of ideas proposition. (Premise.)
5. The UP is not an observation. (Premise.)
6. The UP cannot be justified by induction. (Premise.)
7. The UP is not justified. (From 1, 4, 5, 6.)
8. Conclusions based on induction are not justified. (From 3, 7.)

- Hume considers the possibility that there be a *probabilistic* argument for the UP:

> If we be, therefore, engaged by arguments to put trust in past experience ... these arguments must be probable only, or such as regard matter of fact and real existence. But that there is no argument of this kind, must appear, if our explication of that species of reasoning be admitted as solid and satisfactory. We have said that all arguments concerning existence are founded on the relation of cause and effect; that our knowledge of that relation is derived entirely from experience; and that all our experimental conclusions proceed upon the supposition that the future will be conformable to the past. To endeavour, therefore,

the proof of this last supposition by probable arguments, or arguments regarding existence, must evidently be going in a circle, and taking that for granted, which is the very point in question. (303-4)

- Perhaps this premise:

  2. All inductive inference presupposes the Uniformity Principle.

  is false, because inductive evidence *by itself* supports inductive conclusions.
  - Supporting this: Notice that adding UP to an inductive inference turns it into a deductive inference.
  - So (2) might beg the question.
  - Possible reply: UP could be weakened to "Unobserved objects are *probably* similar to observed objects." Then the inference would not be deductive.
  - This still might be similar to insisting that the rule of inference be added as one of the *premises* of an argument.

A Probabilistic Formulation of Inductive Skepticism

- Assume there is some series of observations. Let

  E = "All the observed A's have been F."   *(The inductive evidence.)*
  H = "The next observed A will be F."   *(A hypothesis supported by induction.)*

- Then we can define the following views:

  Inductivism: P(H|E) > P(H)
  Inductive skepticism: P(H|E) = P(H) (or P(H|E) ≤ P(H))

- "P(H|E)" is read "the probability of H given E". The prob of H being true *if* E is true. "P(H)" refers to the "prior" prob of H, i.e., before we observe E.
- Inductive skepticism is *not* the following trivial view: P(H|E) < 1.

Phil. 4340
Notes: Grue (Nelson Goodman)

The Old Problem of Induction

- The problem of justifying induction.
- Hume's "skeptical solution": Induction is the effect of "custom", not reasoning.
  [• What's wrong with this?]

"Dissolution" of the Old Problem

A) The justification of deduction:
  - Inferences justified by their conformity to valid rules.
  - Rules justified by conformity to accepted practice. [Note an ambiguity: actual practice versus correct practice. Which does he mean?]

B) The justification of induction works the same way.

C) The Paradigm Case Argument:
  - We define "valid induction" [N.B. he means "cogent induction"] by reference to established usage. Compare the definition of "tree". (p. 66)
  - Accepted inductive inferences are thus defined to be cogent -- inductive skepticism is analytically false. Hume's 'solution' is thus shown to be relevant, not a confusion.
  - Compare other applications of the Paradigm Case Argument: free will, knowledge.
  - [To think about: What is wrong with the Paradigm Case Argument?]

The New Problem of Induction

- The problem of stating the rules of induction.
- Hume's account: the UP:
    Observation of an A that is B confirms "All A's are B."
- Grue:
    x is grue = (x is first observed before the year 2100 and x is green) or (x is not first observed before the year 2100 and x is blue).
  - Q: What things in this room are grue?
- Counter-example to Hume's account:
    Evidence: All observed emeralds have been grue.
    Hypothesis: All emeralds are grue.
  - Why does this evidence not confirm this hypothesis?
- Projectibility:
    Projectible hypotheses (generalizations) are confirmed by their positive instances.
    Projectible predicates: predicates that appear in projectible generalizations.
- A failed solution:
  - Projectible predicates contain no particular time references.
  - Answer: "Green" then is not projectible, for
    x is green = (x is first observed before the year 2000, and x is grue) or (x is not first observed before the year 2000 and x is bleen).

Goodman's Solution

Projectible predicates are the more "entrenched" predicates (more often used in actual inductions).

Phil. 4340
Notes: Inference to the Best Explanation (John Foster)

Main Idea

- Induction depends upon inference to the best explanation. An inductive inference actually requires two steps:
    - First: An inference from observations to a hypothesis that provides the best explanation for those observations.
    - Second: An inference from that hypothesis to further predictions. (This step is deductive.)
    - Examples:

(inference to the best explanation) 〔 *Observation*: This coin has come up heads 100 times in a row.

(deduction) 〔 [*Hypothesis*: This coin has heads on both sides.
Prediction: This coin will continue to come up heads in the future.

(inference to the best explanation) 〔 *Observation*: Bodies have always behaved gravitationally.
Hypothesis: It is a law of nature that bodies behave gravitationally.

(deduction) 〔 *Prediction*: Bodies will behave gravitationally in the future.

   - The *hypothesis* is justified because, (a) unless there were some explanation, the *observation* would be highly improbable, and (b) the hypothesis provides the best explanation.
   - *Induction is not a primitive form of inference:* For, imagine that we somehow knew there were no laws of nature. Then would we be justified in thinking bodies will continue to behave gravitationally?

Skeptical Objections

- *Objection*: The observed regularity really doesn't require any explanation, because it is just as likely as every other possible sequence of events. (Example: Coin toss outcomes.)
    - *Reply:* What matters is comparison of the probability of the observed regularity *on the alternative hypotheses*, not its probability compared to that of other possible observations.

- *Objections from alternative hypotheses:*

a) There is no relevant law; past regularity is purely due to chance.
   Problem:
   - This hypothesis is extremely improbable.

b) It is a law of nature that: (up until 2100 A.D., bodies behave gravitationally).
   Problems:
   - This creates a further mystery: What is so special about the year 2100?
   - [Comment: this hypothesis seems to be metaphysically impossible: the current time cannot be a causally relevant factor.]

c) There is a law of nature that (bodies behave gravitationally), but the law ceases to exist in the year 2100 A.D.
   Problems:
   - This creates a further mystery: What is so special about the year 2100?
   - [Comment: this hypothesis seems to be metaphysically impossible: Laws of nature cannot stop existing.]

d) It is a law that (in φ-circumstances, bodies behave gravitationally).
   - We can define "φ-circumstances" in such a way that it applies to all the times when we have actually been observing bodies, but is unlikely to apply to other times.
   - You can do this by constructing a very long disjunction of extremely specific descriptions of states of affairs, where each state obtained at one of the previous times when bodies were observed.
   Problem:
   - This hypothesis gives a different explanation for different cases of gravitational behavior.
   - Our explanation gives a *unified* explanation.
   - Unified (and hence, simpler) explanations are more likely to be true.
     - It is improbable that you just happen to have always been observing during one of the φ-circumstances. I.e., if there were 5 million different causally relevant factors, it is improbable that you would happen to have been looking during exactly the times when one of the relevant circumstances held, unless those circumstances hold almost all the time.

Phil. 4340
Notes: A Probabilistic Solution to the Problem of Induction (David Stove)

I. Important Concepts

- *Inductive inference :* Two kinds:
    - a) Inference from the frequency of a trait in a certain sample drawn from a larger population, to the frequency of that trait in the whole population.
    - b) Like (a), but conclusion is about the presence of the trait in a particular unobserved individual.
- *Proportional syllogism :* Everyone agrees that the following kind of inference is cogent:

    1. 99% of all A's are B.
    2. x is an A.
    3. $\therefore$ x is B.

- *General strategy:* To reconstruct an inductive inference relying only on proportional syllogism and deduction (sc. mathematics), thereby showing that inductive inference is cogent.

II. Mathematical Background

Combinatorics:
- $_nC_k$ (read "n choose k"): This refers to the number of ways of choosing k objects out of a total of n.
- Example: If you have a group of 4 people, how many pairs of people can be chosen from this group? This is $_4C_2$ ("4 choose 2") (which = 6).
- General formula:

$$_nC_k = \frac{n!}{k!(n-k)!}$$

III. A Mathematical Problem

Assume the following:
- Pop is a population of 1 million ravens.
- S is a sample, from Pop, of 3000 ravens.
- 95% of the ravens in S are black.

To prove: It is highly probable that:
- Approximately 95% of the ravens in Pop are black.
- The next raven observed will be black.

General argument:
1. Almost all the 3000-fold samples from Pop are representative (no matter what the proportion of black ravens in Pop). (See below.)
    - Call a sample "representative" if the percentage of black ravens in the sample is within 3% of the percentage in the population.
2. Therefore, S is almost certainly representative. (From 1; proportional syllogism.)
3. The proportion of black ravens in S is 95%. (Given.)
4. Therefore, almost certainly, the proportion of black ravens in Pop is close to 95%. (From 2,3;

deduction.)

5. Therefore (probably), the next observed raven from Pop will be black. (From 4; proportional syllogism.)

Further elaboration:

(1) Almost all the 3000-fold samples of Pop are representative:

- Best case: Suppose the proportion of black ravens in Pop = 100%. Then *all* samples are representative.
- Other best case: Suppose the proportion of black ravens in Pop = 0%. Then all samples are representative.
- Worst case: Suppose the proportion of black ravens in Pop = 50%. Even so, the vast majority of samples are representative.
  - In general:

$$_nC_k = \frac{n!}{k!(n-k)!}$$

  - Total # of 3000-fold samples in Pop:

$$_{1\,million}C_{3000} = \frac{1,000,000!}{(3000!)(997,000!)} \approx 10^{8867.9}$$

  - Number of "representative" samples: S will be representative iff it contains between 1410 and 1590 black ravens (and between 1590 and 1410 non-black ones).
  - Number of samples containing 1410 black ravens and 1590 non-black ones:

$$_{500,000}C_{1410} \times {_{500,000}C_{1590}} = \frac{500,000!}{(1410!)(498,590!)} \times \frac{500,000!}{(1590!)(498,410!)}$$

  - This is not enough: We need the # of samples containing 1410 black ravens + the # containing 1411 black ravens + . . . + the # containing 1590 black ravens. In other words:

$$\sum_{n=1410}^{1590} \frac{(500,000!)^2}{n!\,(500,000-n)!\,(3000-n)!\,(497,000+n)!} \approx 10^{8867.9-.00087}$$

  - The proportion of representative samples, therefore, is:

$$\frac{10^{8867.9-.00087}}{10^{8867.9}} = 10^{-.00087} \approx 99.8\%$$

- Further important points:
  - The qualitative result holds for any population size, and for any sample size ≥ 3000; i.e., the sample will almost certainly be representative. (Statisticians figure out stuff like this.)
  - How does this relate to inference to the best explanation? In the "general argument" above, consider:
    - (3) as the observation
    - (4) as the hypothesis
    - (5) as the prediction

Phil. 4340
Unit Review

<u>Know what these things are:</u>
    Relations of ideas
    Matters of fact
    Uniformity Principle
    Projectible hypotheses
    Projectible predicates
    Kinds of inference:
        Demonstrative
        Non-demonstrative, incl:
            Induction
            Inference to the best explanation
            Proportional syllogism
    Confirmation & "cogent" inferences
    Inductive skepticism
        & probabilistic formulation of
    Grue
        & what the example shows
    The 'old' and 'new' problems of induction (Goodman)
    $_nC_k$

<u>Know what these people thought about inductive inference:</u>
    Hume
    Goodman
    Foster
    Stove

<u>Know these arguments:</u>
    Arg. for inductive skepticism
        & where (if anywhere) the above people would disagree with it
    Foster's justification of induction
        The steps involved in justifying induction
        His criticism of alternative explanations
    Paradigm case argument (Goodman)
    Stove's argument for inductivism, including:
        What kinds of inference he relies on to defend induction

Phil. 4340
Notes: Why People Are Irrational About Politics

I. The problem of political disagreement

- Features of political disagreements:
  a. widespread
  b. strong
  c. persistent
- Theories of political disagreements:
  a. miscalculation + the inherent difficulty of political issues
  b. ignorance, we haven't collected enough information to resolve issues
  c. people disagree because of divergent values
  d. Irrationality

II. Ignorance & miscalculation theories do not explain:

- Persistence of political disagreements
- Strength of political beliefs
- Clustering of logically unrelated beliefs
- Correlations of political beliefs with race, sex, personality traits, etc.

III. Divergent values theory does not explain:

- Why people disagree about values in the first place
- Clustering of logically unrelated beliefs
- Factual disputes

IV. Rational ignorance & rational irrationality

- Two kinds of "rationality":
  - *Instrumental rationality:* consists in choosing the correct means for satisfying your existing desires, whatever they are.
  - *Epistemic rationality:* consists in using correct (logical) reasoning, basing beliefs on evidence, avoiding fallacies, not contradicting oneself, and so on.
- Theory of rational ignorance:
  - It is rational to remain ignorant when costs of collecting information exceed expected benefits.
  - Example: information about political candidates & issues
  - People in fact choose to remain ignorant in these cases.
- Theory of rational irrationality:
  - Assumes:
    a. People have non-epistemic belief preferences: prefer to believe certain things, for reasons independent of the truth or epistemic rationality of those beliefs.
    b. People have some control over what they believe.
    c. People are generally instrumentally rational.
  - Therefore:
    - People choose to adopt epistemically irrational beliefs, when the "costs" of being rational are

1

greater than the expected benefits.
- • This includes most political beliefs.

V. Sources of belief preferences

- • People are biased by self-interest + interests of the group they prefer to identify with
- • People adopt beliefs to accord with the self-image they want to project
- • Political beliefs can serve as tools of social bonding.
- • People are biased towards other beliefs that cohere with their existing beliefs.

VI. Mechanisms of belief fixation

a. Biased weighting of evidence: we attribute slightly more weight to each piece of evidence that supports our belief, and slightly less weight to each piece of evidence that undermines our belief, than it merits.
   - This is part of *confirmation bias*.
b. Selective attention and energy: we spend more time/energy thinking about arguments supporting or beliefs than arguments criticizing them. But we spend more time looking for flaws in arguments opposing our beliefs than in arguments supporting them.
c. Selection of evidence sources: we get political information from sources we already know we agree with.
d. We base beliefs on subjective, speculative, and anecdotal claims. These are more subject to bias.

VII. What should we do?

- • Avoid using mechanisms in (VI).
- • Be aware of cases where we are likely to be biased.
- • Regard others' political claims with skepticism.
- • Identify what sort of evidence is required to scientifically resolve a factual question, or test a factual claim. Ask whether one has such evidence.

Phil. 4340
Notes: Is Critical Thinking Epistemically Responsible?

I. Target: The Critical Thinking Orthodoxy

- Background stipulations:
  - You are interested in some *controversial, publicly discussed* issue.
  - You are an ordinary person.
- Three approaches:
  - *Skepticism:* Withhold judgment.
  - *Credulity:* Rely on experts. Experts, by definition: are knowledgeable, are intelligent, and have devoted time and effort to studying the issue.
  - *Critical Thinking:* Figure out for oneself. Notes:
    - ✐ This is meant in a non-trivializing sense.
    - ✐ The subject uses his own judgment about first-order evidence about issue x.
    - ✐ There is more to "critical thinking" than this. But this is what we are talking about.
- *Thesis:*
  - Critical Thinking normally inferior to Credulity.
  - Teaching of Critical Thinking is a mistake.

II. Medical Example

- You are sick. Should you:
  a) Follow a doctor's advice?
  b) Diagnose yourself, and determine the correct treatment yourself?
- What if you mistrust the doctor's opinion? Should you:
  a) Get a second opinion from another doctor?
  b) Diagnose and treat yourself?
- How is critical thinking different from medical self-diagnosis?
  - Most publicly-discussed issues require expertise.
  - You probably don't have it.
  - There are experts who do.

III. How Reliable Is Critical Thinking?

1. One should not prefer a less reliable belief-forming method over a more reliable one (if one can tell which is more reliable).
   - Comment: this is true even if one of the "methods" is reliance on some innate cognitive faculty of one's own.
2. Experts are more reliable than ordinary people. Some reasons for this:
   - More knowledgeable.
   - More intelligent.
   - More time and effort spent.
   - *Objection:* Experts may be biased.
     - ✐ *Reply:* You can also be biased.
3. If (2), then Critical Thinking is less reliable than Credulity.
4. Therefore, one should not prefer Critical Thinking over Credulity. (From 1-3.)

IV. Consistency of Critical Thinking Theory

A scenario: An ordinary undergraduate student has taken a critical thinking course (with a reasonably good grade). He has done his best to think critically about a controversial, publicly-discussed issue. He has concluded that the answer to the issue is X.

Q: On this basis, should you accept X as true?

- If "yes": You are not using critical thinking. And this is highly implausible.
- If "no":
    - You recognize that the student's opinion is insufficiently reliable.
    - I.e., critical thinking doesn't work.
    - Conclusion: you should tell the student not to rely on it either.
    - *To think about:* What epistemological theory enables you to advise someone else to rely on some information source, while you yourself refuse to rely on it?

V. Objections & Replies

A. Why not use both Credulity and Critical Thinking?
- There are many experts to consult.
- Added benefit of Crit Thinking is negligible.
- Introduces danger of bias.

B. Critical thinking trains future academics.
- No worries about future supply of academics.
- Curriculum should not be geared toward 0.1% of the student body.
- Objection does not address issue of epistemic rationality. Teaching of Critical Thinking might benefit society, but still be teaching people to be epistemically irrational.

C. Maybe we have goals other than truth.
- Whatever they are, experts are probably better at those things too.
- Ex.: Consistency, coherence, support by evidence, rationality.

D. Thesis is self-undermining, because most experts endorse Critical Thinking.
- Objection is also self-undermining.
- The arguments above need to be evaluated by the experts.

E. We must use Critical Thinking to evaluate the experts.
- Reminder: interpret thesis non-trivially.
- Substantive point: Evaluation of expertise is easier than direct evaluation of issues.
- Ex.: Congress & courts often call "expert witnesses". Why do they not call "meta-expert witnesses" to tell them who the first experts are, and so on *ad infinitum*?

VI. When Critical Thinking Might Be Rational

- Personal life decisions - there is no body of experts.
- When the experts are not good at CT, but somehow you are. (?)
- When the experts are not *trying* CT, but you are.

Phil. 4340
Notes: Political Expertise

I. Background: Why care about political expertise?

- People must make political decisions, based on political opinions.
- The "experts" seem like the most likely source for such opinions.
- They are relied upon by activists and policy makers.
- Q: Are they any good?

II. Expert Reliability

- Is political expertise genuine? How to approach:
  - Get experts to make falsifiable predictions about (semi-)observable matters of fact.
  - We could ask them moral or ideological questions, but no clear way to test accuracy.
- Tetlock collected predictions and tested them over 20 years.
- Results:
  - No one is very accurate. The best experts are slightly better than chance.
  - Mathematical formulas do better.
  - Experts were highly overconfident. Events predicted with 65-70% probability happened only 12-15% of the time.
  - Assigning equal probability to every outcome gives better calibrated probabilities.
  - Well-informed amateurs do about as well as experts.

III. What Went Wrong?

- Confirmation bias:
  - We look for evidence supporting existing beliefs.
  - We scrutinize counter-evidence more carefully.
  - We place greater emphasis on confirmatory evidence.
- Human pattern-seeking. People look for patterns. When we look for them we "see" them, even in random data.
- Political/social science is in a primitive state. Almost all current theories are wrong.

IV. Expert Rationalizations

- Experts rarely gave up their theories in response to failed predictions. Instead, they produced belief-system defenses, e.g.:
  - *Minimizing the error:* "The false prediction was due to a minor error that doesn't reflect on the underlying theory." E.g., "my policy failed only because it was poorly implemented."
  - *The close-call counterfactual:* "Well, it *almost* happened."
  - *The exogenous shock:* "It would have happened if not for some weird interfering factor that couldn't have been anticipated."
  - *I made the right mistake:* E.g., "It was prudent to err on the side of caution."
  - *Timing:* "I was just off on the timing; it's going to happen later."
  - *Bad luck:* "Well, unlikely things sometimes happen."
- But, what's wrong with these defenses? Maybe they are true.

- But experts virtually never use these arguments to explain away their *successful* predictions. E.g., they don't say, "Well, I was almost wrong" or "I was right for minor reasons that don't reflect on my underlying theory."

V. Cognitive Styles: The Fox and the Hedghog

- The Hedghog:
  - Knows one big thing. Simpler world view.
  - Tend to be more extreme politically, and to have more extreme predictions.
  - Higher confidence.
  - Less accurate predictions.
  - These people are found on both the left and the right of the political spectrum.
- The Fox:
  - Uses many miscellaneous pieces of knowledge.
  - Thought contains more qualifications, lower confidence.
  - Tend to be more moderate.
  - More accurate predictions.

VI. What Should We Do?

- Be like the fox.
- Menand's conclusion:

  "But the best lesson of Tetlock's book may be the one that he seems most reluctant to draw: Think for yourself."

  Q: Is this the best lesson of the book?

Phil. 4340
Notes: How Science Goes Bad

I. Background

- Some questions medical researchers study:
    - Should you drink a lot of water during exercise?
    - Does fish oil reduce Alzheimer's risk?
    - Do cell phones cause brain cancer?
    - Should you avoid sunlight to reduce cancer risk?
    - etc.
- How are these questions studied?
    - The effects (if any) are statistical, usually small.
    - Divide subjects into two groups:
        - Experimental group: Gets the drug, food, treatment, or whatever.
        - Control group: Doesn't get it.
    - Observe statistical difference in the disease, condition, etc., between groups.
- Statistical significance:
    - "The null hypothesis": This is the hypothesis that the thing being studied (drug, etc.) has no real effect.
    - Scientists calculate the probability of observing differences of (at least) the observed magnitude *on the null hypothesis.* This is the "p value".
    - If this probability is very low, then the result is "statistically significant".
    - Typical thresholds for statistical significance:
        - .05, .01, .001 (5%, 1%, and 0.1%).
    - Commonly reported as: "The result was statistically significant at the .01 level" or "the correlation was significant (p < .01)".
- The Bayesian view: Bayesians (named after the 18th century mathematician, the Rev. Thomas Bayes) think p-values are an inadequate test.

    - Bayes' Theorem: $$P(h \mid e) = \frac{P(h) \times P(e \mid h)}{P(e)} = \frac{P(h) \times P(e \mid h)}{P(h)P(e \mid h) + P(\sim h)P(e \mid \sim h)}$$

    - Significance testing looks only at one factor: $P(e \mid \sim h)$ (and perhaps also $P(e \mid h)$).
      Why do they do this? They don't want to get into $P(h)$ and $P(\sim h)$.
    - Bayesians say you have to account for $P(h)$, $P(e)$, etc.
    - Specifically: Ioannidis says you have to take account of the percentage of hypotheses that are true in a given field (this is an estimate of $P(h)$). E.g., if you get p=.01, but only 1% of all hypotheses in that field are true, then the hypothesis is only 50% likely.

II. Problems with Medical Research

- Researchers have come to conflicting conclusions on all of the above-mentioned questions.
- Frequency with which studies are later proved wrong:
    - Non-randomized studies   80%
    - Randomized trials   25%
    - Large randomized trials   10%
- Doctors and other researchers may continue to rely on studies without knowing of later studies that

refuted them.
- How many studies are false but never retested?
- How does this happen?
  a) *Selection bias in publication:*
    - Many teams study the same question.
    - Even if there is no effect (the null hypothesis is true), 5% of the time, they will "find" an effect "significant at the .05 level."
    - So one in 20 research teams will find an effect. The one that finds the effect publishes it.
    - The other 19 don't publish anything.
    - Medical journals are more likely to publish positive results than negative results.
  b) *Data mining:*
    - Any complex set of data has apparent patterns.
    - There are many possible hypotheses:
      . With *n* variables, you can formulate $2n(n\text{-}1)$ causal hypotheses of the form "A promotes/inhibits B".
      . E.g., with genetic hypotheses, there are tens of thousands of genes one can test.
    - If you allow conjunctive factors ("A when combined with B promotes C"), the number of possible hypotheses is almost unlimited. E.g., consider these headlines:
      "Fruits, vegetables cut cancer risk for smokers"
      "Soy may ease sleep problems in older women"
    - If there are no relationships at all (the data is entirely random), 1 in 20 hypothesized relationships will still test as "significant at the .05 level". 1 in 100 will be "significant at the .01 level".
    - Researchers can look through the data until they find an apparently significant relationship (this is called "data mining").
  c) *Researcher bias:*
    - Researchers who have obtained "important" results are more likely to get funding in the future.
    - Positive results lead to publication, prestige, tenure, etc.
    - Prominent scientists can use peer review to suppress opposing views.

III. Conclusion: What Should We Do?

- Become more confortable with error. Put less emphasis on getting interesting results.
- Replication.
- For ordinary people: Ignore most medical research.

Phil. 4340
Unit Review

Know these concepts:
    Kinds of rationality
        Instrumental
        Epistemic
    Rational ignorance
    Rational irrationality
    Non-epistemic belief preferences
    Critical thinking, Huemer's def.
    Credulity
    Confirmation bias
    Foxes & hedgehogs
    Statistical significance, p values

Know these arguments:
    Why & when it may be rational to be
        ignorant (about what kinds of things)
    Why it might be rational to be irrational
        about politics
    Unreliability of critical thinking/ reliability of
        credulity
    Inconsistency of Crit thinking

Know about these results:
    Tetlock's study: its main results
    Ways of rationalizing failed predictions:
        Close-call counterfactual
        Minimizing error
        Exogenous shock
        Bad luck
        Timing
        The right mistake
    Ioannidis: main claim about medical studies
    Reasons medical studies go wrong, incl.:
        Publication selection bias
        Data mining
        Researcher bias

Know these people's basic views:
    Huemer, on
        Rational irrationality
        Critical thinking
    Tetlock
    Ioannidis

Know these examples & what they show:
    Diagnosing own illness