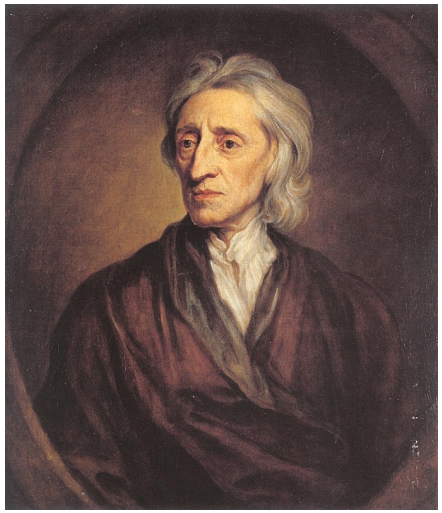
Philosophy 203
History of Modern Western Philosophy

Russell Marcus
Hamilton College
Spring 2012



Class 13 - Locke
Against Innate Ideas
For the Primary/Secondary Distinction

Business

- Midterm Next Thursday
  - Descartes, Hobbes, Spinoza, Leibniz, Locke
  - Reading Guide Questions
  - Short(-er) list on line
- Today:
  - Finish absolute v relational space
  - Start on Locke and the British empiricists

Newton and Leibniz

Do space and time have absolute reality? Are they merely relational concepts?

- Newton's view is absolutist.
  - Space is something distinct from the bodies that occupy it.
  - Time is something that passes uniformly without regard to events in the world.
  - Space is an empty container, and time marches inexorably forward.
  - Though we measure space and time using bodies and events, these are only indicative of relative motions.
- Leibniz is a relationalist
  - Space and time are idealizations.
  - They are abstractions from the realities of the material world.
  - "I hold space to be something merely relative, as time is...an order of coexistences, as time is an order of successions" (LIII.4, AW 297b).
  - Phineas and Ferb

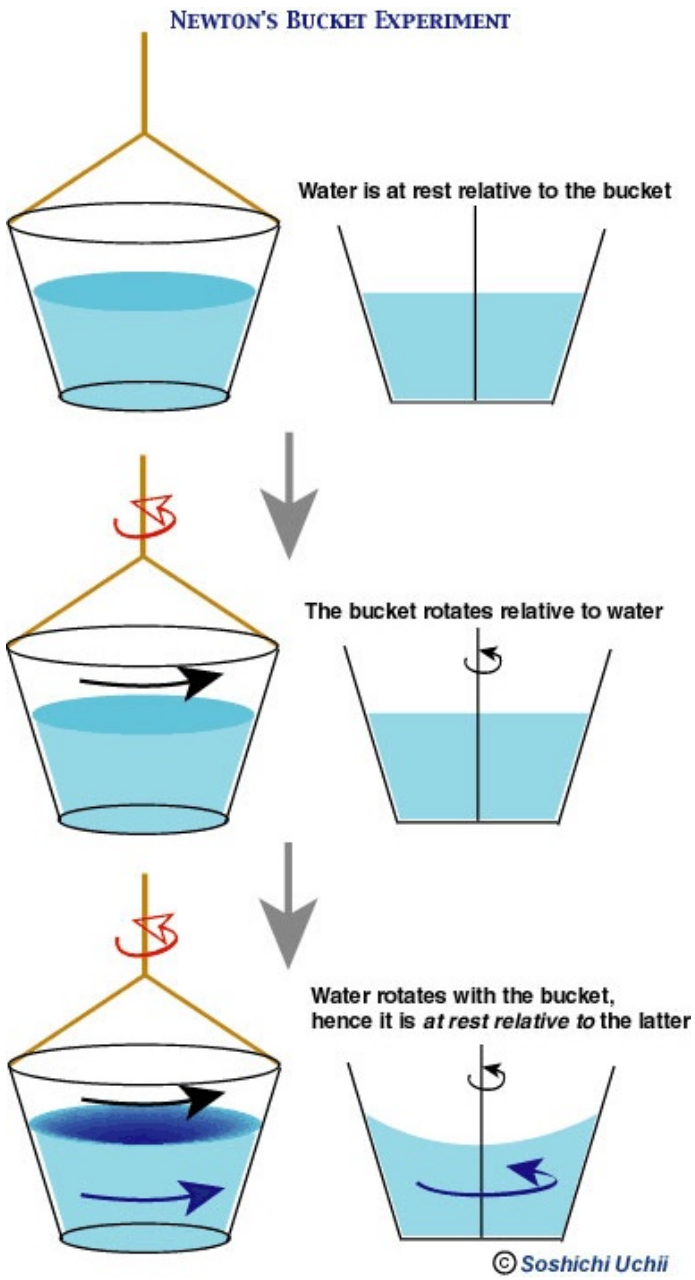
Newton's Views on Space and Time

- Absolute time passes steadily without relation to anything external, and thus without reference to any change or way of measuring of time.
- Absolute space remains without relation to anything external.
  - Relative spaces are measures of absolute space defined with reference to some system of bodies.
- Absolute motion is the translation of a body from one absolute place to another.
  - Relative motion is the translation from one relative place to another.
- There is a fact of the matter whether a given body moves and what its true quantity of motion is.
- The true motion of a body does not consist of, or cannot be defined in terms of, its motion relative to other bodies.
- Space is the sensorium of God, the seat of divine cognition.

Measuring Velocity

A Problem for Newtonian Absolutism

- The absolute speed of a body is supposed to be the rate of change of its position relative to an arbitrary point of absolute space.
- According to Newton's account, absolute velocity is a well-defined quantity.
- But consider, as Galileo did, riding in a ship at a constant velocity.
- We cannot determine from observations inside the cabin whether the boat is at rest in harbor or sailing smoothly.
- Absolute velocity cannot be experimentally determined.
  - "Yet the thing is not altogether desperate; for we have some arguments to guide us, partly from the apparent motions, which are the differences of the true motions, partly from the forces, which are the causes and effects of the true motions" (Scholium to Definitions in *Principia*, AW 288a).


NEWTON'S BUCKET EXPERIMENT
Water is at rest relative to the bucket
The bucket rotates relative to water
Water rotates with the bucket,
hence it is at rest relative to the latter
© Soshichi Uchii

Newton's Bucket

- We know that the motions are different in the two states, but we can not differentiate them in terms of local changes of place.
- In both state 1 and state 3, the water and the bucket are at relative rest.
- But state 3 is measurably different to state 1.
- The relationalist seems unable to describe the difference between the two states.
- The absolutist needs merely to point out that in state 3, the system is in absolute motion, while in state 1, the system is at absolute rest.
- Absolute acceleration (change in motion) is thus a measurable quantity.

Leibniz, Against Newton

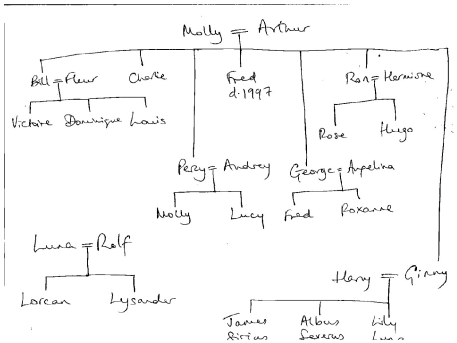
- “Our dispute consists in many other things. The question is whether God does not act in the most regular and most perfect manner; whether his machine is liable to disorder, which he is obliged to mend by extraordinary means; whether the will of God can act without reason; whether space is an absolute being; also concerning the nature of miracles; and many such things, which make a wide difference between us” (LIII.16, AW 299a).
- We are focusing only on the question of whether space is relational or absolute.

Sir Isaac Newton (left) and Gottfried Wilhelm von Leibniz (right)

Revenge of the Great Principles

- "Those great principles of sufficient reason and of the identity of indiscernibles change the state of metaphysics. That science becomes real and demonstrative by means of these principles, whereas before it did generally consist in empty words" (LIV.5, AW 299b).
- Could the universe, for example, have been created at a different time?
- Could it be moved three inches to the left?
  - Or east changed for west?
- There would be no way to distinguish two universes that were identical in all their relations among objects, but put into a different space or reoriented.
- "Those two states, the one such as it is now, the other supposed to be the quite contrary way, would not at all differ from one another. Their difference therefore is only to be found in our chimerical supposition of the reality of space in itself. But in truth, the one would exactly be the same thing as the other, they being absolutely indiscernible, and consequently there is no room to inquire after a reason for the preference of the one to the other" (LIII.5, AW 297b-298a; see also LIV.13, AW 300a-b).

Leibnizian Space and Time



- Space is a set of relations among bodies.
- Time is an abstract relation among events (or perceptions).
- Those systems of relations might be thought of as abstract, but they should not be reified.
- The family tree analogy
- No really existing thing could be infinitely divisible.
  - We must take space and time to be ideal, or imaginary constructs derived from the appearances of bodies.
- Bodies, for Leibniz, are just appearances.
  - Space and time turn out to be abstractions on what is already only a mere appearance.
  - The only reality is monadic.
  - Monads have temporal properties, but not spatial properties, except in a thin, derivational sense.


GOTTFRIED
Leibniz
AT LAST—MY COMPUTATIONAL MACHINE IS FINALLY FINISHED—IT'S THE FIRST OF ITS KIND ON THE EUROPEAN CONTINENT!
I'D LIKE TO SEE THAT THIEVING BASTARD NEWTON TRY TO TOP THIS!
sigh AH WELL... EVERYTHING IS A PART OF GOD'S PLAN, SUFFERING AND ENVY SIMPLY A PHENOMENON OF PERCIPIENT BEINGS...IT CAN ONLY BE THE BEST OF ALL POSSIBLE WORLDS, AS SUCH...
THOUGH IT'D BE A HELLUVA LOT BETTER WITHOUT DIRTY PLAGIARIZING ENGLISH SCIENTISTS

End Continental Rationalism

Return to our senses

Locke's *Essay*

- over-written
- long-winded
- insightful
- fecund
- your grandmother's attic

Locke's Goals

- Reign in the rationalists' speculative metaphysics.
  - "It may be of use to prevail with the busy mind of man to be more cautious in meddling with things exceeding its comprehension, to stop when it is at the utmost extent of its tether, and to sit down in a quiet ignorance of those things which, upon examination, are found to be beyond the reach of our capacities" (I.I.4, AW 317a).
- Avoid skepticism while limiting the scope of the undertanding.
  - Descartes's standard for knowledge is too high.
  - "If we disbelieve everything because we cannot certainly know all things, we shall do quite as wisely as he who would not use his legs, but sit still and perish, because he had no wings to fly" (I.I.5, AW 317b-318a).
- Present a less-contentious epistemology.
  - "Men, barely by the use of their natural faculties, may attain to all the knowledge they have, without the help of any innate impressions, and may arrive at certainty without any such original notions or prinicples"(I.II.1, AW 319a).

Four Central Topics in Locke's Work

1. Arguments against innate ideas
2. The primary/secondary distinction
3. An account of personal identity, including Locke's approach to the mind/body problem
4. Locke's philosophy of language, including the doctrine of abstract ideas

koinai ennoia

- Descartes had pure intuitions, and clear and distinct perceptions of innate ideas.
  - the self
  - God
  - mathematics
  - laws of physics
- Spinoza
  - rational and intuitive knowledge
  - Our minds are literally part of God.
- Leibniz
  - truths of reason
  - Against transeunt causation, monads are self-contained.
- Grand metaphysical systems which claimed that reality is much different from our ordinary interpretations of sense experience.

Limits of Innateness Claims

- We do not know some of the ideas which Descartes and others allege to be innate.
  - "It is evident that all *children*...do not have the least apprehension or thought of them. And the lack of that is enough to destroy that universal assent which must be the necessary concomitant of all innate truths..." (§I.II.5, AW 319b).
- Goldbach's conjecture
- The defender of innate ideas might claim that such ideas require development.
  - We have to reason to them, or unfold them from within.
- Locke takes such recourse on the part of the rationalist to be a concession.
  - "It [seems] to me near a contradiction to say that there are truths imprinted on the soul which it does not perceive or understand" (§I.II.5, AW 319b).

The Doctrine of Universal Assent

- Locke ascribes a doctrine of univeral assent to the rationalists.
- It is difficult to discern precisely the argument Locke attributes to the rationalists.
- Three possibilities, for any proposition p:
  - UA1 Everyone agrees that p if and only if p is innate.
  - UA2 If everyone agrees that p, then p is innate.
  - UA3 If p is innate, then everyone agrees that p.
    - Note: UA1 is just the conjunction of UA2 and UA3.
- The examples of children and Goldbach's conjecture undermine UA3, but, they leave UA2 alone.

Against UA2

UA2 If everyone agrees that p, then p is innate.

- Locke provides further examples which undermine UA2.
  - Green is not red.
  - “I imagine everyone will easily grant that it would be impertinent to suppose the *ideas* of colors innate in a creature to whom God has given sight and a power to receive them by the eyes from external objects...” (I.II.1, AW 319a).
- It is likely that some of the defenders of innate ideas contemporary with Locke did hold some form of a doctrine of universal assent.
- But, no one appeals explicitly to such a doctrine, so it is difficult to know how important Locke’s criticisms really are.
- UA2 and thus UA1 are not plausibly ascribed to defenders of innate ideas.
- Locke’s criticisms of those claims seem irrelevant.

Univeral Assent and Poverty of the Stimulus

- UA3 is the most plausible form of the doctrine of universal assent.
  - If p is innate, then everyone agrees that p.
- But it does not give us a way to pick out the innate ideas.
- Moreover, none of the rationalists we have read appeal to the doctrine of universal assent to defend innate ideas.
- Instead, they appeal to an argument that has come to be known as a poverty of the stimulus argument.
  - Sense experience is insufficient to account for some kinds of knowledge.
  - Thus, we must posit some innate ideas or capacities.
- Noam Chomsky and Linguistic Nativism
  - Children learn both the vocabulary and grammar of their first language too quickly to be explained by behavioral conditioning.
- No one questions whether experience is necessary for us to have knowledge.
  - Some people do not assent to the supposedly-innate ideas.
- The question is whether experience is sufficient to account for what we know.
- The defender of innate ideas need not give up the project on the basis of the kind of evidence that Locke presents against UA3.

Innateness and Experience

- II is very close to what Descartes actually says about mathematical propositions.
  - II An idea is innate if it is not possible to learn it from experience.
- We can't acquire the innate ideas and we can't create them, so they must be innate.
- If the empiricist opponent of the doctrine of innate ideas wants to undermine II, she should show that experience is sufficient to account for our knowledge of the purportedly innate ideas.
- If Locke can show how to justify our beliefs while avoiding any appeal to innate ideas, we might prefer his empiricist account.
  - Ockhamist principles of simplicity

Locke's Positive Project

- We are born with no innate knowledge, no principles imprinted on the understanding.
- He does not appeal to claims that depend on the rationalists' innate ideas, especially claims about the nature of God and the soul.
- Locke doesn't reject the claim that we have knowledge of God.
- He just argues that our idea of God comes from experience, rather than from naturally imprinted first principles.
  - If we examine the *idea* we have of the incomprehensible supreme being, we shall find that...the complex *ideas* we have both of God and separate spirits are made of the simple *ideas* we receive from *reflection*: e.g. having, from what we experiment in ourselves, gotten the *ideas* of existence and duration; of knowledge and power; of pleasure and happiness; and of several other qualities and powers, which it is better to have than to be without. When we would frame an *idea* the most suitable we can to the Supreme Being, we enlarge every one of these with our *idea* of infinity; and so putting them together, make our complex *idea of God* (II.XXIII.33, AW 366b).

Two Lines of Attack

against the rationalists

1. Give up some of the general principles supposedly known innately.

2. Attempt to reclaim some of the knowledge that was formerly thought to rely on innate ideas.

Two tools

1. Sensation, and any ideas which can be attributed to our sense experience
2. Psychological capacities of our minds, including memory and the ability to reflect on our ideas.

- Contemplation
- Memory
- Discerning
- Comparison
- Composition
- Abstraction

The *Tabula Rasa*

Let us then suppose the mind to be, as we say, white paper, void of all characters, without any *ideas*. How does it come to be furnished? From where does it come by that vast store which the busy and boundless fancy of man has painted on it with an almost endless variety? From where does it have all the materials of reason and knowledge? To this I answer, in one word, from *experience*; our knowledge is founded in all that, and from that it ultimately derives itself. Our observation employed either about *external sensible objects* or *about the internal operations of our minds, perceived and reflected on by ourselves, is that which supplies our understandings with all the materials of thinking*. These two are the fountains of knowledge, from which all the *ideas* we have, or can naturally have, do spring (II.I.2, AW 323a).

Perceptions

- Individual perceptions are simple.
- Impressions of the same object under different sense modalities are independent.
  - The taste of the lemon is independent of its yellowness, and of its texture and odor.
- Locke's claim that the sense modalities are independent explains his response to the Molyneux problem.
  - "Suppose a man born blind, and now adult, and taught by his touch to distinguish between a cube and a sphere of the same metal, and nearly of the same bigness, so as to tell, when he felt one and the other, which is the cube, which the sphere. Suppose then the cube and sphere placed on a table, and the blind man be made to see. Quaere, whether by his sight, before he touched them, he could now distinguish and tell which is the globe, which the cube?" (II.IX.8, AW 338b).
- Locke denies that the blind person could tell which was the sphere and which was the cube without touching the objects.
  - Our sense of touch is independent of our vision.
- There is experimental research supporting Locke's solution, but the question has not been resolved completely

Sensation and Reflection

- Simple ideas of sensation come from individual sense experiences of particular objects.
  - We can hold those ideas in memory, and recall them.
  - Language primarily consists of names of our simple ideas.
- Using our naturally developing ability to reflect, we can go beyond the limits of particular sense experience, and memory of such experience.
  - "The other fountain from which experience furnishes the understanding with ideas is the *perception of the operations of our own mind* within us, as it is employed about the *ideas* it has gotten - which operations, when the soul comes to reflect on and consider, do furnish the understanding with another set of *ideas*, which could not be had from things without. And such are *perception*, *thinking*, *doubting*, *believing*, *reasoning*, *knowing*, *willing*, and all the different actings of our own minds, which we, being conscious of and observing in ourselves, do from these receive into our understandings as distinct *ideas* as we do from bodies affecting our senses... I call this REFLECTION" (II.I.4, AW 323b).

Varieties of Reflection

- Locke uses ‘reflection’ to cover a wide variety of psychological capacities.
  - contemplation
  - memory
  - discerning
  - comparison
  - composition
  - abstraction

Abstraction

- We can, for example, generalize, or abstract, to find universals, like those of mathematics.
- “The senses at first let in particular *ideas*, and furnish the yet empty cabinet, and the mind by degrees growing familiar with some of them, they are lodged in the memory, and names got to them. Afterwards the mind proceeding further abstracts them, and by degrees learns the use of general names” (I.II.15, AW 321a).
- Thus, Locke believes that we have some innate, if developing, capacities to reflect on our own ideas.
- We will return to the process of abstraction next week.

Similarity and Difference

- We can recognize similarities and differences among our ideas.
- If we will reflect on our own ways of thinking, we shall find that sometimes the mind perceives the agreement or disagreement of two *ideas* immediately by themselves, without the intervention of any other. And this, I think, we may call *intuitive knowledge* (IV.II.1, AW 389a).
- This activity yields intuitive knowledge of the agreement or disagreement of ideas.
- Locke claims that there are four kinds of agreement or disagreement among ideas.
    1. Identity or diversity;
    2. Relation;
    3. Coexistence or necessary connection; and
    4. Real existence.
- These comparisons can be *intuitively* apprehended without commitments to innate ideas.

Similarity, Difference and Plato

- Plato argued, in the *Phaedo*, that we can not learn about equality merely by seeing equals, that we must have knowledge of equality in order even to see two objects as equals.
  - We bring our concept of equality (identity and difference) to our experiences.
  - We can not learn it from those experiences.
- Plato concludes that we are born with knowledge, foreshadowing the moderns' doctrine of innate ideas.
- Locke uses the argument to deflate the innatists' claims.
  - "This is so absolutely necessary that without it there could be no knowledge, no reasoning, no imagination, no distinct thoughts, at all. But this the mind clearly and infallibly perceives each *idea* to agree with itself, and to be what it is, and all distinct *ideas* to disagree, i.e., the one not to be the other, And this it does without pains, labor, or deduction, but at first view, by its natural power of perception and distinction" (IV.I.4, AW 386b).
- All we need to perform these kinds of reflections is a natural power of perception and distinction.

Demonstrative Knowledge

- In addition to intuitive knowledge, Locke claims that reflection yields demonstrative knowledge.
  - Demonstrative knowledge requires proof.
  - Each step of the proof must be intuitive.
- Demonstrative knowledge requires chains of reasoning.
  - Doubt, which does not infect intuitive knowledge of agreement of ideas, can arise.
- Demonstrative knowledge grounds both mathematical and moral claims.
  - Mathematics is justified by a combination of intuitive first principles and secure methods of proof
    - Euclid, Frege
  - In moral philosophy, Locke also claims that we have intuitive knowledge of some primitive relations among ideas.
    - "*Morality* [is] *among the sciences capable of demonstration*; in which I do not doubt but from self-evident propositions, by necessary consequences, as incontestable as those in mathematics, the measures of right and wrong might be made out to anyone who will apply himself with the same indifference and attention to the one as he does to the other of these sciences... "*Where there is no property, there is no injustice*," is a proposition as certain as any demonstration in *Euclid*" (IV.III.18, AW 397b-398a.).

The Challenge for Locke

- We have seen that Locke criticizes innate ideas, and argues that we have psychological capacities for attaining reflective knowledge.
- Further, he criticized Descartes's demand for indubitable certainty.
- Still, if he is not to beg the question of whether knowledge is possible, he should explain, in greater detail, how sense experience leads to veridical beliefs.
- Can Locke account for the errors which motivated Descartes, the false beliefs that he had taken as true in his youth, and demonstrate ways to avoid such errors without relying on innate ideas?

Four Central Topics in Locke's Work

✔1. Arguments against innate ideas

2. The primary/secondary distinction

3. An account of personal identity, including Locke's approach to the mind/body problem

4. Locke's philosophy of language, including the doctrine of abstract ideas

Descartes Against the Senses

- Aristotle had taken sensory qualities to be properties of external objects.
  - The redness and sweetness of an apple are real properties of the apple itself.
  - Our senses are attuned to the external environment.
  - Color vision occurs when a person's eyes are changed to be like the color of an external object.
- Descartes presented (at least) three considerations which weighed against the veridicality of sense experience:
  1. The illusion and dream doubts;
  2. The wax argument; and
  3. The rejection of the Resemblance Hypothesis on the basis of the example of the sun.
- The moral of the illusion argument is merely to take care to use one's senses in the best way possible.
  - We need not dismiss all of our sense evidence on the basis of illusion.
  - The dream doubt encourages a mere skepticism.0
  - Locke puts skepticism aside.

Appearance, Reality, and the Wax

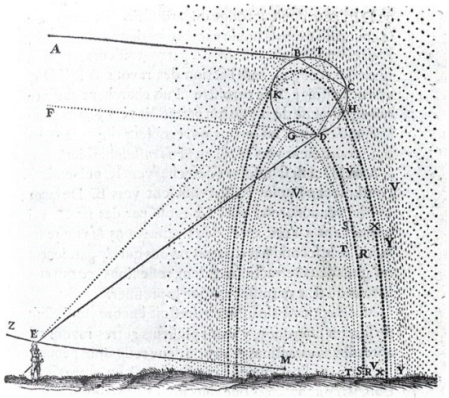
- Physical objects can have contradictory sense properties.
  - The wax (like all material objects) is an extended body which can take various manifestations.
  - The same object may have many different appearances.
  - We should identity objects with none of their particular sensory qualities.
- The appearance of an object is distinct from its real qualities.
- Which qualities are real, and which are mere appearances?
  - The primary/secondary distinction

Primary Qualities Before Locke

- Descartes believed that the only real property of physical objects was their extension.
  - "The only principles which I accept, or require, in physics are those of geometry and pure mathematics; these principles explain all natural phenomena, and enable us to provide quite certain demonstrations regarding them" (Descartes, *Principles of Philosophy* II.64, AT VIIIA.78)
  - Imagination is not capable of representing true extension.
  - We use pure thought.
- Boyle and Galileo
  - size, shape, mass, motion, and number
  - Again, mathematically-describable properties
- The expansion of the list of real properties from Descartes's extension to the other qualities does not indicate any difference in principle.
  - The primacy of mathematics

Secondary Properties Before Locke

- Descartes's rejection of the Resemblance Hypothesis
  - The sun example
  - Sensory properties are artifacts of interactions between our bodies and other bodies.
  - They are not real properties of those external bodies.
  - "Most philosophers maintain that sound is nothing but a certain vibration of the air which strikes our ears. Thus, if the sense of hearing transmitted to our mind the true image of its object then, instead of making us conceive the sound, it would have to make us conceive the motion of the parts of the air which is then vibrating against our ears" (Descartes, *Le Monde*, AT XI.5).
- Descartes is a nominalist about secondary properties.



Locke's Water Experiment

- The same object displays incompatible properties at the same time.
- The Heraclitean response to the wax example
  - "No one subject can have two smells or two colors at the same time. To this perhaps will be said, has not an opal, or the infusion of *lignum nephriticum*, two colors at the same time? To which I answer that these bodies, to eyes differently placed, it is different parts of the object that reflect the particles of light. And therefore it is not the same part of the object, and so not the very same subject, which at the same time appears both yellow and azure. For it is as impossible that the very same particle of any body should at the same time differently modify or reflect the rays of light, as that it should have two different figures and textures at the same time" (IV.III.15, AW 396b).
- The Heraclitean response is unavailable in the water case.
  - The exact same water displays the incompatible properties.
- Locke needs an account of the error that will not force us to abandon all sense experience to the poverty of the stimulus argument.

Ideas of an Apple

- Red
- Round
- Cool to the touch
- Sweet, though a bit sour
- Shiny
- Smooth
- Sits still on the table
- Crunchy
- Weighs 4 oz.
- Has a mass of 120 grams
- Is one apple
- Is being considered by you
- Smells like, well, an apple

Locke's Principles

- Locke tacitly presumes two principles to distinguish veridical ideas from misrepresentative ones.
- LP1: If one perceives an object as having two (or more) incompatible ideas, then those ideas do not represent real properties of the object.
  - Besides hot and cold, other sense ideas are not veridical, according to LP1.
  - Color in porphyry (II.VIII.19)
  - Taste in almonds (II.VIII.20)
  - Descartes's wax example
- LP1C1: Even if a change in us entails the change in the perceived quality, the ideas which change can not be veridical.
  - Orange juice
- LP1C2: Qualities that appear different to different observers are not veridical.
  - Color-blindness

Locke's Second Principle

- LP2: If an idea of an object is the same under all conditions, that idea is veridical.
  - "We may understand how it is possible that the same water may, at the same time, produce the sensations of heat in one hand and cold in the other; which yet figure never does, that, never producing the *idea* of a square by one hand, which has produced the *idea* of a globe by another" (II.VIII.21, AW 335b).
- LP2C: If every observer receives the same idea from an object, then that idea is veridical.

Apple, Redux

- Red — Misrepresentative
- Round — Real
- Cool to the touch — Misrepresentative
- Sweet, though a bit sour — Misrepresentative
- Shiny — Misrepresentative
- Smooth — Misrepresentative
- Sits still on the table — Real
- Crunchy — Misrepresentative (But consider its brittle texture)
- Weighs 4 oz. — Misrepresentative
- Has a mass of 120 grams — Real
- Is one apple — Real
- Is being considered by you — Misrepresentative
- Smells like, well, an apple — Misrepresentative

- Thus, we have arrived at the primary/secondary distinction via argument:
- "These I call *original* or *primary qualities* of body, which I think we may observe to produce simple *ideas* in us, namely, solidity, extension, figure, motion or rest, and number. *Secondly*, such *qualities* which in truth are nothing in the objects themselves but powers to produce various sensations in us by their *primary qualities*...these I call *secondary qualities"* (II.VIII.9-10, AW 333a-b).

Primary Qualities and Secondary Qualities

- Primary
  - Solidity
  - Extension
  - Figure
  - Motion/ Rest
  - Number
- Secondary
  - Color
  - Odor
  - Hot/ Cold
  - Sound
  - Texture
  - Taste
- We can justify our beliefs on the basis of sense experience without worrying that we will be forced to accept errors as true because we are relying on our senses, rather than pure reason.

A Worry

- “Qualities thus considered in bodies are, first, such as are utterly inseparable from the body in whatever state it is, such as in all the alterations and changes it suffers, all the force can be used upon it, it constantly keeps, and such as sense constantly finds in every particle of matter which has bulk enough to be perceived, and the mind finds inseparable from every particle of matter, though less than to make itself singly perceived by our senses -e.g., take a grain of wheat, divide it into two parts, each part has still *solidity*, *extension*, *figure*, and *mobility*; divide it again, and it retains still the same qualities; and so divide it on until the parts become insensible, they must retain still each of them all those qualities” (II.VIII.9, AW 333a).
- Why doesn’t the change in extension of the wheat show that extension is a secondary quality?
- Do electrons have shape?

The Primary/Secondary Distinction, the Resemblance Hypothesis, and Empiricism

- Locke accepts the Resemblance Hypothesis, for primary qualities only.
  - The *ideas of primary qualities* of bodies *are resemblances* of them and their patterns do really exist in the bodies themselves, but the *ideas produced* in us *by* these *secondary qualities have no resemblance* of them at all. There is nothing like our *ideas* existing in the bodies themselves (II.VIII.15, AW 334a).
- Our ideas of extension resemble extension in the world.
- My ideas of secondary qualities do not resemble anything in an object.
- On the basis of my ideas of primary qualities, then, I can justify significant conclusions about the world (i.e. the new science) without appealing to innate ideas.

Descartes and Locke

- Both Descartes and Locke were writing in support of modern science.
- Descartes believes that the essential characteristic of physical objects is extension.
- Locke believes that extension is just one of several primary qualities.
- They disagree more strongly about how we know about those properties.
- Their disagreement is mainly epistemological, not metaphysical.

Locke's Metaphysics

- God, finite intelligences, bodies
- The material world is nothing but particles in motion.
- Sense qualities of objects are not really in the world.
  - Lemons are not really yellow, or sour.
  - They are made of particles (atoms or corpuscles) that appear yellow or sour to normal human senses.
  - These minute particles unite in varying ways.
  - Depending on how they unite, they affect us in different ways.
- We might say that the lemon has a 'dispositional property' which makes us see it as yellow.
  - But the dispositional property is not yellowness, which is, properly speaking, a property only of my experience.

Galileo and Locke

- ...that external bodies, to excite in us these tastes, these odours, and these sounds, demand other than size, figure, number, and slow or rapid motion, I do not believe, and I judge that, if the ears, the tongue, and the nostrils were taken away, the figure, the numbers, and the motions would indeed remain, but not the odours, nor the tastes, nor the sounds, which, without the living animal, I do not believe are anything else than names (Galileo, *Opere* IV, 336).
- Take away the sensation of them; let the eyes not see light, or colors, nor the ears hear sounds; let the palate not taste, nor the nose smell; and all colors, tastes, odors, and sounds as they are such particular *ideas* vanish and cease, and are reduced to their causes, i.e., bulk, figure, and motion of parts (Locke, II.VIII.17, AW 334b).