

Class #4 - Sense Experience  
Descartes, "The Story of the Wax"  
Descartes, "The Story of the Sun"  
Locke, "On the Primary/Secondary Distinction"

I. *Inception*

The relevance of *Inception* to our work is in the difference between waking states and dreaming states. In the movie, some of the characters have a totem.

Totems are supposed to be indicators of whether one is in a waking state or a dream state.

Moll puts away her totem, choosing to live in a dream state.

It seems that she controls her beliefs, that she is making a decision to believe that the dream state is real.

Would this decision be inconsistent with the doxastic involuntarism we discussed earlier?

We know from reading and discussing Descartes's First Meditation that any totem is impossible.

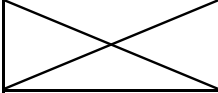
We would need to know that the totem is a true indicator of the difference between waking and dream states.

Take, for example, the spinning-top totem.

If the top continues to spin, one has good evidence that one is in a dream state.

But if it were to stop, the evidence would be ambiguous.

Let's name the two different kinds of errors we could commit in considering whether we are dreaming or awake.

	I am really awake	I am really dreaming
I believe that I am awake	True	False - Type A
I believe that I am dreaming	False - Type B	True

First, we could dream that the top stops spinning, assume that the evidence shows that we are awake, and so make a Type A error.

Second, even the good evidence of the totem is not infallible.

One might be mistaken about the properties of the totem and come to believe that one is dreaming accidentally.

The empirical possibility of a totem is nearly as difficult to accept as the possibility that we can inhabit someone else's dream state.

We can come to believe that someone else is dreaming, from the outside, by observing REM and other external conditions, like looking and brain activity.

But the possibility of inhabiting another person's experience seems to be conceptually impossible.

## II. Why Do You Believe?

- C1. You exist.
- C2. You are taking a philosophy class.
- C3. Your best friend likes you.
- C4. Katy Perry and Russell Brand are divorcing.
- C5. Shakespeare wrote *The Tragedy of Macbeth*.
- C6. The sun will rise tomorrow.
- C7. An object in motion will remain in motion, an object at rest will remain at rest, unless acted upon by an unbalanced force.

Look for general principles.

Are these things that we know?

How do we know what we know?

## III. Sense Experience and the Story of the Wax

The question that divides empiricists from rationalists is whether sense experience is sufficient for knowledge.

It might be useful to look more closely at sense experience itself.

Notice to start that what seems categorical in our sense experience may not be.

For instance, I look outside the window, in bright daylight, and I see a tree.

I can imagine that anyone else standing next to me will see the same tree.

But, our experiences, strictly speaking, differ.

The angle from which we see the tree is different, so the retinal image we have will differ.

I interpret my retinal image as that of a tree; someone else might see the same object as *quercus rubra*, or red oak.

These aren't inconsistent impressions, but they are different.

Even more upsetting to the categoricity of sense experience, consider the Molyneux problem, made famous by John Locke.

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. Quære, whether by his sight, before he touched them, he could now distinguish and tell which is the globe, which the cube (II.IX.8)?

Locke denies that the blind person could tell which was the sphere and which was the cube without touching the objects.

In other words, 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](#).

It turns out that blind people, if given the ability to see, can not discriminate among objects.

All they get are splotches of color.

If such a person were to stand beside me gazing at the tree, she would not see a tree at all.

In the later portions of the Second Meditation, Descartes presents a worry about experience.

Consider a ball of wax in two distinct states.

First, it is cold, hard, yellow, honey-flavored, and flower-scented.

Then, we bring the wax near a fire.

After it is melted, the wax becomes hot and liquid, and loses its color, taste, and odor.

In short, all of its sensory properties have changed.

We have images of the wax, in several incompatible states.

But we do not have an image of what the wax is, independent of these mutable appearances: the essence of the wax, or wax in general.

Such an image would have to represent to us all the possible states of the wax.

Our knowledge of bodies, as they truly are, must therefore be distinct from our sensory images of them.

I grasp that the wax is capable of innumerable changes of this sort, even though I am incapable of running through these innumerable changes by using my imagination... The perception of the wax is neither a seeing, nor a touching, nor an imagining...even though it previously seemed so; rather it is an inspection on the part of the mind alone (AW 46a).

According to the new science, the wax is just a body which can take various manifestations, hot or cold, sweet or tasteless, etc., but is identified with none of these particular sensory qualities.

Perhaps the wax was what I now think it is: namely that the wax itself never really was the sweetness of the honey, nor the fragrance of the flowers, nor the whiteness, nor the shape, nor the sound, but instead was a body that a short time ago manifested itself to me in these ways, and now does so in other ways... Let us focus our attention on this and see what remains after we have removed everything that does not belong to the wax: only that it is something extended, flexible, and mutable (46a).

Bodies are things that can have sensory qualities, but which need not have any particular ones.

The same object may have many different appearances.

The moral of Descartes's claim is that sense experience does not lead to knowledge.

#### IV. The Resemblance Hypothesis and the Story of the Sun

The story of the wax supports Descartes's claim that the world is not as it appears.

Our senses may be misleading, either in small ways, as when we perceive an illusion, or in larger, systematic ways, if we are dreaming or deceived.

More importantly, the wax example shows that physical objects are essentially none of their sense characteristics.

The world out there is unlike the world as it appears to us.

The claim that our sensory ideas are like the world may be called the resemblance hypothesis.

Aristotle had defended the resemblance hypothesis, taking sensory qualities to be real 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.

For example, color vision occurs when a person's eyes are changed to be like the color of an external object.

I see the apple as red because my eye itself is able to change to red.

The eye's changing to match the environment is perception.

On Aristotle's view, our ideas resemble their causes, and objects really have the properties that we perceive them to have.

Descartes rejects the resemblance hypothesis.  
He provides an example of the sun.  
The senses tell us that the sun is very small.  
We reason that the sun is very large.

Both ideas surely cannot resemble the same sun existing outside me; and reason convinces me that the idea that seems to have emanated from the sun itself from so close is the very one that least resembles the sun (Third Meditation).

Descartes's view, as we discussed, is that our knowledge of physical objects does not come from the senses.  
Knowledge of objects comes from the mind alone.  
Descartes claims that our most secure knowledge, like that of mathematics, is innate, built into our minds.  
Our knowledge of the physical world is really just knowledge of physics, since the sense properties of objects aren't really the sorts that can be known.  
What can be known about the world is its mathematical properties.  
And the mathematical properties are innate, built into our minds by the goodness of God.

Descartes's view is odd.  
In response, some philosophers defended the veracity of sense experience.  
We will look at two such empiricists: Locke and Berkeley.

## V. Sensation and Abstraction

Locke denies Descartes's claims about innate ideas.  
He claims that the mind begins as a blank slate, or *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 (II.I.2).

We learn particulars, first, beginning with sense experience.  
We get simple ideas of sensation from individual sense experiences of particular objects.  
Individual perceptions are simple.  
They are so simple, in fact, that 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 hypothesis concerning the Molyneux problem.

Once we have received simple sense impressions, we can hold the ideas they create in memory, and recall them.  
Our ability to recall simple ideas is facilitated by our use of language, which primarily consists of names of our simple ideas.  
We can also reflect on those simple ideas.

Using our naturally developing ability to reflect, we can go beyond the limits of particular sense experience, and memory of such experience.

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).

So, for Locke, we have two distinct kinds of capacities for learning, for writing on our blank slate.

First, we have our sense experience.

Then, we have our ability to reflect on, and abstract from, that sense experience.

Still, the problems of sense experience which convinced Descartes that sensory beliefs could not be knowledge continue to hold: the dream doubt, the wax example, the sun example.

The wax argument proceeded by demonstrating a single physical object with contradictory sense properties.

Just as I can not both be in my office and not in my office, or both tall and short, the wax can not be both yellow and clear, both smell of flowers and lack odor.

Descartes's conclusion was that the wax is an extended body which can take various manifestations, hot or cold, sweet or tasteless, but is identified with none of these particular sensory qualities.

That is, physical objects are essentially things which can have sensory qualities, but which need not have any particular ones.

The same object may have many different appearances.

The appearance of an object is distinct from its real qualities.

To avoid such problems, Locke presents what has come to be known as the primary/secondary distinction.

Agreeing in part with Descartes, Locke claims that some apparent properties of physical objects are misleading; objects do not really have those properties.

Locke calls the misleading appearances of objects their secondary qualities.

In contrast, according to Locke, some apparent properties of objects are veridical.

He calls these the primary qualities.

The challenge for Locke is to distinguish the primary qualities from the secondary qualities, to distinguish the veridical appearances from the misrepresentative ones.

## VI. Locke's Principles

While the primary/secondary distinction pre-dates Locke by at least a century, Locke provides a comprehensive argument for the distinction.

Locke's water experiment (II.VIII.21) plays a role in his epistemology similar to the wax example for Descartes.

Consider three buckets, each containing water of a different temperature: hot, lukewarm, and cold.

Put one hand into the hot water and one into the cold water, and let them sit for a short while.

Then, take them out, and put both hands into the lukewarm water.

The lukewarm water will feel hot to one hand, and cold to the other.

The water, like the wax, displays incompatible sense properties.

Note that Locke's example is even more compelling than Descartes's.  
In the water experiment, the same object displays incompatible properties at the same time.

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).

Locke tacitly presumes two principles to distinguish veridical ideas from misrepresentative ones. The first principle is destructive, yielding misrepresentative properties.

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. The example of porphyry in the dark (II.VIII.19) shows that color is a secondary quality. Taste and odor are shown secondary by LP1, because an almond changes taste and odor when mashed (II.VIII.20).

Applying LP1 to Descartes's wax example, we can see that we have ideas of secondary qualities in all five sense modalities.

Consider tasting orange juice before and after brushing your teeth. What tasted sweet before, tastes sour (for want of a better word) after. Thus, the sweetness and sourness are not real qualities of the orange juice. The orange juice example leads to a corollary to the first principle:

LP1C1: Even if a change in us entails the change in the perceived quality, the ideas which change can not be veridical.

Now, consider the color impressions of a normal-sighted person and a color-blind person. The differences show, once again, that color is not a real quality of an object. We can infer a second corollary:

LP1C2: Qualities that appear different to different observers are not veridical.

The above principle and its corollaries support Locke's primary/secondary distinction by allowing Locke to account for sense error.

Locke's second principle is constructive, yielding veridical properties.

LP2: If an idea of an object is the same under all conditions, that idea is veridical.

LP1 and LP2 allow us to distinguish among our sense experiences. Some sense experience is veridical, and can be trusted. Some sense experience is misrepresentative, and can not be trusted.

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 fire 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).

The second principle also has a corollary.

LP2C: If every observer receives the same idea from an object, then that idea is veridical.

## VII. The Apple Exercise

Using LP1, LP2, and their corollaries, rank each quality of an apple from 1 (veridical) to 5 (misrepresentative).

Then, draw a line between the properties that you think are not really qualities of an apple and those which really are qualities of the apple.

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 maybe real, if we consider its brittle texture)
Weights 4 oz.	Misrepresentative
Has a mass of 120 grams	Real
Is one apple	Real
Is being considered by you	Misrepresentative
Smells like an apple	Misrepresentative

### VIII. The Primary/Secondary Distinction

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).

Primary Qualities	Secondary Qualities
Solidity	Color
Extension	Odor
Figure	Hot/ Cold
Motion/ Rest	Sound
Number	Texture
	Taste

### IX. The Primary/Secondary Distinction, the Resemblance Hypothesis, and Empiricism

Locke presents the primary/secondary distinction in defense of his claim that we can justify our beliefs without appeal to innate ideas.

Descartes's strongest argument against the veridicality of sense experience relied on his examples of the wax and the sun in support of his rejection of the Resemblance Hypothesis.

The primary/secondary distinction allows Locke to defend a weakened version of 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).*

Our ideas of extension resemble extension in the world.

For example, I have an idea that this piece of paper is 11 inches long.

So, the paper really is 11 inches long.

My idea of the motion of a car resembles the real motion of that car.

The car really is moving.

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 knowledge of the world without appealing to innate ideas.

The metaphysical upshot of the primary/secondary distinction, then, is that the world is nothing but particles in motion, and that the 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.

Their arrangement determines how we experience an object.

The lemon can take on other appearances, in other circumstances, to other observers, who will all agree on the size and shape of the lemon.

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.

We have ideas which arise from the interaction between our senses and the material world.

The material world exists independently of us, and has its primary qualities truly, but depends on us for sensory (secondary) properties.

Here's Galileo on the primary/secondary distinction:

...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 (*Opere IV*, 336).

Compare Galileo's formulation to Locke's:

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 (II.VIII.17).

Descartes held a restrictive version of the primary/secondary distinction, believing 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 VIII.A.78)

Further, he argued that mathematical claims are not derived from sense evidence, since our imagination is not capable of representing true extension.

We think of extension mathematically, using pure thought.

Descartes's view that extension is the only essential property of physical objects was not standard.

Most philosophers of the modern era held views closer to that of Locke and Galileo, believing that physical objects really had primary qualities of size, shape, mass, motion, and number.

The expansion of the list of real properties from Descartes's extension to the other qualities, though, does not indicate any difference in principle.

Given Locke's primary/secondary distinction, the question remains why lemons, for example, appear to be yellow and bitter.

For both the moderns and contemporary neuroscientists, we lack an explanation of the connection between my conscious experience of objects and their causes.

Why is it that such and such motions in the air cause me to hear a symphony?

Why is it that certain wavelengths of light cause me to see blue?

That the size, figure, and motion of one body should cause a change in the size, figure, and motion of another body is not beyond our conception. The separation of the parts of one body upon the intrusion of another and the change from rest to motion upon impulse, these and the like seem to have some *connection* one with another. And if we knew these primary qualities of bodies, we might have reason to hope we might be able to know a great deal more of these operations of them one upon another. But our minds not being able to discover any *connection* between these primary qualities of bodies and the sensations that are produced in us by them, we can never be able to establish certain and undoubted rules of the consequence or *coexistence* of any secondary qualities, though we could discover the size, figure, or motion of those invisible parts which immediately produce them. We are so far from knowing what figure, size, or motion of parts produce a yellow color, a sweet taste, or a sharp sound that we can by no means conceive how any *size, figure, or motion* of any particles can possibly produce in us the *idea* of any *color, taste, or sound* whatsoever; there is no conceivable *connection* between the one and the other (IV.III.13).

If your parents are giving you a hard time about studying philosophy, since it never makes any progress, you might want to keep them away from that quote.

It's the kind of thing that gives people like me nightmares.

We really haven't made any progress in the last three centuries of trying to answer that question.

That question is essentially what [David Chalmers](#) calls the hard problem of consciousness.

The easy problem is to map the brain, and to know all its functions.

Once we have done that, though, we still won't be any closer to an answer to why certain neural firings correspond to certain conscious experiences.

Berkeley rejects the primary/secondary distinction for reasons similar to these worries, as we will see in our next class.