

Class #13 - Against Innate Ideas, For the Primary/ Secondary Distinction
Locke, *An Essay Concerning Human Understanding*
Book I, Chapters 1-2 (AW 316-322)
Book IV, Chapters I-II (AW 386-392)
Book II, Chapters I-IX (AW 322-339)

I. Locke's *Essay*

Locke's 1690 *Essay Concerning Human Understanding* is over-written and long-winded, but it contains some of the most insightful and fecund work of his time.

Reading Locke's *Essay* has been compared to going into your grandmother's attic.

There's a lot of stuff in there and a lot of it is really cool.

But you have to find it amid the dust and clutter.

Leibniz worked through the *Essay* in detail, responding with a book-length commentary, *New Essays on Human Understanding*.

If you are [looking for a paper topic](#), there are lots of good ones to be found in the contrasts between Leibniz and Locke.

Ariew and Watkins present just a portion of the *Essay*.

We will read only a portion of their selections.

Locke's work comes in large part as a response to Descartes, and also to Spinoza and Leibniz, though Leibniz is really a contemporary of Locke.

Leibniz's *Discourse on Metaphysics* was written four years before Locke's *Essay*, though the *Monadology* was not written until almost twenty-five years later.

The rationalists embrace intuition and reasoning, what Locke calls *koinai ennoiai* (primary notions) or innate ideas, as central aspects of their work.

Descartes claims that we have pure intuitions, clear and distinct perceptions of innate ideas.

For Descartes, ideas of the self, God, and mathematics are innate, built into our minds.

Laws of physics, depending as they do on mathematics, are also innate, the result of pure, intellectual judgment.

Spinoza relies on innate ideas, as well, calling them rational and intuitive knowledge.

Leibniz defends innate truths of reason as the source of the most certain beliefs, opposing truths of fact.

The very nature of the monad, which reflects the entire history of the universe, makes its ideas innate.

Leibniz denied transeunt causation, which entails that ideas can not, strictly speaking, ever be acquired.

All three of the rationalists we read built grand metaphysical systems which claims that reality is much different from our ordinary interpretations of sense experience.

Locke wants to limit the scope of pure understanding and reign-in 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).

Locke's belief that many philosophers claim to know more than they can know might seem to lead to skepticism, a denial that we can know anything.

Recall that Descartes seemed unable to justify any of his beliefs without relying on the existence and goodness of God, the arguments for which he supposed to be innate.

Descartes is driven to his position by his claim that we must be certain of something beyond any doubt if we are to know it.

Unless we defeat the deceiver, we know almost nothing.

One might thus believe that rejecting speculative metaphysics entails conceding to the skeptic and ceding all of our beliefs.

Locke, in contrast, believes that Descartes's standard for knowledge is too high and that we can know about the world around us without proving the existence of God.

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).

While knowledge may not, contra Descartes, entail certainty or the KK thesis, it does require justification and truth.

If we know that *p*, then *p* must be true and we must have good reasons to believe that *p*.

But, according to Locke, it does not follow that I must not be able to doubt that *p*.

Locke thus does not worry about defeating a deceiver.

And he thinks that there are easy refutations of the dream doubt, ones which do not depend on reasoned belief in an omnipotent creator.

If anyone says a dream may do the same thing, and all these *ideas* may be produced in us without any external objects, he may please to dream that I make him this answer: 1. That it is no great matter, whether I remove his scruple or not; where all is but dream, reasoning and arguments are of no use, truth and knowledge nothing. 2. That I believe he will allow a very manifest difference between dreaming of being in the fire and being actually in it (IV.II.14, AW 392a).

Instead of working to overcome such doubts, Locke just pursues good justifications for the beliefs he will count as knowledge.

We will cover four central topics in Locke's work:

Arguments against innate ideas

The primary/secondary distinction

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

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

Locke, like Hobbes, is known for his work on political theory and the social contract.

In this course, though, we will hardly mention those aspects of his work.

II. Against Innate Ideas

Locke, like most philosophers of the modern period (Berkeley is one significant exception), defended the new science and its method of experimentation.

The new science posits a world of material objects available to sense perception.

We think about material objects through our imagination, our capacity to represent sensory images.

The rationalists derogated beliefs that were based on sense perception.

For Descartes, sense images are confused and the only real properties are those we can understand by pure reason, our innate ideas.

An innate idea is one that is implanted in our minds rather than learned from sense experience. We are born with innate ideas, according to their proponents, which is why everyone has them, and everyone agrees about them.

Locke argues that he can avoid appealing to innate ideas by accounting for all of human knowledge on the basis of sense experience.

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 principles (I.II.1, AW 319a).

He points out that we do not know some of the ideas which Descartes alleges are innate. For example, children do not know lots of them.

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).

For accounts of innate ideas on which mathematical claims are innate, like all of those we have studied, we need not appeal to the limitations of children to support Locke's claim.

Consider Goldbach's conjecture, that every even number can be written as the sum of two odd primes.

There is no proof, yet discovered, of Goldbach's conjecture.

Even the best mathematicians do not know if it is true.

Thus we can not claim that there is universal assent to Goldbach's conjecture.

Given that every one doesn't know some of their innate ideas (e.g. Goldbach's conjecture) and some people (e.g. small children) do not know any of them, 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).

Remember that for Descartes, consciousness is the mark of the mental.

Perhaps we need not recall all of our clear and distinct ideas in order to know them.

But to think that there are innate ideas that are inaccessible to us seems, to Locke, to be implausible.

None of the rationalists we have read appeal to a doctrine of universal assent to defend innate ideas.

Instead, they appeal to an argument that has come to be known, in contemporary work, as a poverty of the stimulus or poverty of the evidence argument.

According to poverty of the evidence arguments, sense experience is insufficient to account for some kinds of knowledge.

Descartes argued that all ideas must be innate, acquired, or produced by me; but some ideas could neither be acquired nor produced by me.

There must be innate ideas because other evidence is too weak to account for our knowledge of mathematics or God.

In contemporary linguistics, Noam Chomsky has argued that children learn both the vocabulary and grammar of their first language too quickly to be explained by behavioral conditioning (i.e. sense experience).

Chomsky argues that the poverty of the stimulus shows that our brains are hard-wired to learn language, with universal grammar built into them.

We call Chomsky's view linguistic nativism.

Note the similarity between Chomsky's argument and Descartes's argument for innate ideas.

In contrast, Locke focuses on the doctrine of universal assent.

It is difficult to discern precisely the argument he attributes to the rationalists.

Here are 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 .

UA1 is just the conjunction of UA2 and UA3.

Locke argues that there are no propositions for which UA3 holds.

The consequent of UA3 is false for some people no matter what proposition we consider.

Small children don't know any innate ideas.

Even the best mathematicians lack knowledge of Goldbach's conjecture.

We need experience to learn some supposedly-innate ideas.

Those without that experience do not hold those ideas.

For any purportedly-innate idea, there will be someone who does not assent to it.

The examples of children and Goldbach's conjecture undermine UA3 but leave UA2 alone.

Locke provides further examples which undermine using UA2 to conclude that there are innate ideas.

He presents claims that engender widespread agreement while being tied to sense experience.

For example, he considers the claim that green is not red.

No one believes that experience of color is innate.

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 I have read appeals explicitly to such a doctrine.

And none of UA1-UA3 seem particularly plausible principles to ascribe to the defender of innate ideas.

No one questions whether experience is necessary for us to have knowledge.

Here's Leibniz, from his detailed study of Locke's work, *New Essays on Human Understanding*.

I cannot accept the proposition that whatever is learned is not innate. The truths about numbers are in us; but we still learn them... (Leibniz, *New Essays*, 85).

The defender of innate ideas does not deny that some people do not assent to the supposedly innate ideas. The question is whether experience is sufficient to account for what we know.

Although the senses are necessary for all our actual knowledge, they are not sufficient to provide it all, since they never give us anything but instances, that is particular or singular truths. But however many instances confirm a general truth, they do not suffice to establish its universal necessity; for it does not follow that what has happened will always happen in the same way (Leibniz, *New Essays*, 49).

The defender of innate ideas need not give up the project on the basis of the kind of evidence that Locke uses against invoking UA1-UA3.

Something like II would be more plausible to ascribe to the rationalists.

II An idea is innate if it is not possible to learn it from experience.

Indeed, II is very close to what Descartes actually says about mathematical propositions.

We can't acquire them 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.

That's Locke's positive project.

III. Locke's Positive Project

Locke's empiricist claim is that we are born with no innate knowledge, no principles imprinted on the understanding.

Thus 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 argues that our idea of God comes from experience rather than from imprinted first principles.

Some of us saw arguments like this from Hobbes in the *Objections and Replies*.

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, got 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).

As a rule, the empiricist has difficulty explaining our knowledge of mathematics.

It is difficult to see how experience can support universal claims about mathematical objects, which are not sensible.

Locke's account of our knowledge of mathematics, like his account of our knowledge of God, does not rely on innate ideas.

Instead, it relies on intuition and demonstration, starting with ideas of sensation, and then using reason to discover relations among them.

I do not doubt but it will be easily granted that the *knowledge* we have of *mathematical truths* is not only certain, but *real knowledge*, and not the bare empty vision of vain insignificant *chimeras* of the brain. And yet, if we will consider, we shall find that it is only of our own *ideas* (IV.IV.6, AW 404b).

Locke's empiricist strategy thus has two lines of attack.

In one direction, Locke gives up some of the general principles supposedly known innately.

In the other direction, Locke attempts to reclaim some of the knowledge that was formerly thought to rely on innate ideas.

Locke has two sets of tools for that reclamation project.

First, he has sensation and any ideas which can be attributed to our sense experience.

Second, he has the psychological capacities of our minds, including memory and reflection.

While Locke rejects innate principles, he does not deny our natural capacity to reason and intuit.

IV. Sensation and Reflection

Locke 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. 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).

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 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. 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, AW 338b).

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](#).

Once we receive simple sense impressions, we can hold the ideas of them 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, think about them and draw conclusions based on them.

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 acts 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).

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

Locke uses 'reflection' to cover a wide variety of psychological capacities, including contemplation, memory, discerning, comparison, composition, and 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, despite Locke's rejection of innate ideas, he believes that we have some innate, if developing, capacities to reflect on our own ideas.

For another example, we can recognize similarities and differences among our ideas, an activity which yields intuitive knowledge of the agreement or disagreement of 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).

For those of you who took Ancient, you might recall Plato's argument, 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.

Plato uses that argument to conclude that we are born with knowledge, foreshadowing the moderns' doctrine of innate ideas.

Locke uses the argument to deflate the innatists' claims.

Locke claims that there are four kinds of agreement or disagreement among ideas.

These comparisons can be intuitively apprehended without appealing to innate ideas.

1. Identity or diversity;
2. Relation;
3. Coexistence or necessary connection; and
4. Real existence.

Locke claims that our ability to recognize identity and diversity is undeniable, but does not reflect our having been born with innate principles.

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.

In addition to intuitive knowledge, Locke claims that reflection yields demonstrative knowledge. Demonstrative knowledge requires proof and each step of the proof must be intuitive. Because demonstrative knowledge requires chains of reasoning, doubt, which does not infect intuitive knowledge of agreement of ideas, can arise even though the individual steps are intuitively justified by sense perception.

Demonstrative knowledge grounds both mathematical and moral claims.

The picture of mathematical beliefs being justified by a combination of intuitive first principles and secure methods of proof has a long history.

In mathematics, as in philosophy, though, the kinds of claims that are made on the basis of intuition have given that capacity a bad name.

By the late 19th Century, serious worries about the consistency of calculus, which relied on intuitive claims about infinitesimals, combined with strange results in non-Euclidean geometries and transfinite mathematics, impelled mathematicians to seek a more secure standard of proof.

Gottlob Frege replaced Locke's intuitive guarantee of the steps in a proof with a syntactic criterion, and revolutionized logic, creating what we now know as modern symbolic, or mathematical, logic.

In moral philosophy too, Locke claims that we have intuitive knowledge of some primitive relations among ideas.

And in both cases, we derive more complex ideas by reflecting and abstracting from them.

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.).

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?

V. Appearance and Reality

As we saw, Locke rejects a contentious form of the doctrine of innate ideas.

He doesn't seem to be arguing against specific arguments in Descartes, Spinoza, or Leibniz, say, but against a position which holds claims like UA1-UA3.

Locke has thus been accused of attacking a straw person rather than a serious argument. Still, that criticism holds only against the negative arguments against abstract ideas. Locke's positive claim, that our beliefs can be justified by appeal only to sense experience and some basic mental capacities, is independent of his criticisms of innate ideas. If he can show how we acquire knowledge while avoiding any appeal to innate ideas, we might prefer his empiricist account to a more tendentious rationalist system. We might, that is, appeal to Ockhamist principles of simplicity to support Locke's account. So it will be worthwhile to return to Descartes's criticisms of sense experience. We want to see how Locke deals with the problems that impel Descartes to denigrate sense experience.

Descartes presents three considerations 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 to take care to use one's senses in the best way possible. It impugns sense evidence when we are in poor conditions, looking at distant or very small objects, say. We need not dismiss all of our sense evidence on the basis of illusion, as Descartes admitted.

Descartes dismissed the dream argument, in Meditation Six, almost without argument. There, he relies on the goodness of God not to deceive. If we withhold the divine guarantee, Descartes's argument against the possibility of systematic deception due to dreaming is weak. Locke's arguments against the dream doubt, recall, are no stronger than Descartes's, but he holds them with more conviction.

Where all is but dream, reasoning and arguments are of no use, truth and knowledge nothing...[there is] a very manifest difference between dreaming of being in the fire and being actually in it (IV.II.14, AW 392a).

But the dream doubt is a skeptical hypothesis, difficult, perhaps impossible, to defeat. One reasonable response to the skeptic is merely to ignore her. In any case, Descartes's other two arguments are more serious.

The wax argument proceeds by demonstrating a 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 is 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. 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. The obvious question for us metaphysicians is which qualities are real and which are mere appearances. As we saw, the distinction between the real and merely apparent qualities of objects has come to be known as the primary/secondary distinction. The primary qualities are the real ones, and the secondary properties are the apparent ones.

Descartes, recall, believes that the only real property of physical objects is 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, 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 during the modern era.

Many philosophers of that era believed that physical objects really had primary qualities of size, shape, mass, motion, and number.

Those philosophers, like Galileo who wrote that the book of nature is written in the language of mathematics, argued for the reality of other 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 mathematical properties explains Descartes's rejection of the Resemblance Hypothesis on the basis of the example of the sun.

Descartes contrasts our sense idea of the sun (as very small) with the mathematical idea of the sun (very large) and favored the latter.

Again, Descartes dismisses sense properties, taking only mathematical properties as real.

He thinks of the secondary, sensory properties, as artifacts of interactions between our bodies and other bodies, and not as 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).

If my experience of sound really resembles the sound, then I should hear motion, not music.

Thus, Descartes is a nominalist about secondary properties.

VI. Locke's Arguments for the Primary/Secondary Distinction

While the primary/secondary distinction pre-dates Locke by at least a century, and we saw it in our discussion of the work of both Descartes and Hobbes as well as Galileo's formulation, Locke provides a comprehensive argument for the distinction.

Locke agrees with Descartes and other earlier philosophers that at least some sense qualities are not veridical.

The debate between Locke and Descartes concerns whether no sense experience is veridical.

We will look first at Locke's arguments for the primary/secondary distinction and then turn to his use of that distinction in the service of his empiricism.

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.
I mentioned that one possible response to the wax argument is Heraclitean.
The Heraclitean argues that any change in the properties of an object entails a change in the object itself.
Or, for two objects to be the same object, they must share all properties.
The Heraclitean claims that the wax before melting and after melting are different objects, and so no contradiction arises among the sensory properties.
There are just two different objects, loosely tied together merely by a name, 'wax'.
Locke's solution to Descartes's problem is roughly Heraclitean.

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](#),¹ 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, though effective in the wax example, is unavailable in the water case.
The exact same water displays the incompatible properties.
If we are going to base our knowledge on our sense experiences, we have to have some account of the error that will not force us to abandon all sense experience.
That is the role to which Locke puts the primary/secondary distinction.

We might have the following 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 apple-like

¹ Now known as *pterocarpus indicus*, it is a wood that takes on a blue-ish tone after being infused with water.

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.

LP1C1: Even if a change in us entails the change in the perceived quality, the ideas which vary 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.

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

LP1 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.

We can see Locke's use of LP2 in his discussion of the globe and square.

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).

While I take LP2 to concern an individual's perceptions, it also appears to have a corollary which concerns multiple observers.

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

Let's apply the principles to our 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
Weighs 4 oz.	Misrepresentative
Has a mass of 120 grams	Real
Is one apple	Real
Is being considered by you	Misrepresentative
Smells apple-like	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	Secondary Qualities
Solidity	Color
Extension	Odor
Figure	Hot/ Cold
Motion/ Rest	Sound
Number	Texture
	Taste

Locke continues to classify as tertiary ideas those that we impute to an object on the basis of its power to change the appearance of another object.

He uses the example of the power of the sun to make wax white.

We need not concern ourselves with tertiary qualities.

No one takes the tertiary qualities to be real properties of an object.

The point of appealing to the primary/secondary distinction is to show that empiricism is plausible, that 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.

I believe that LP2 and LP2C accurately reflect Locke's intentions.

But, Locke can be sloppy in his discussions of the veridical properties.

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).

Here, I worry that Locke's examples undermine his claims.

If we divide the grain of wheat in half, it has half the extension.

Thus, extension seems unstable.

The change in the taste of an almond upon mashing was supposed to show that taste is a secondary quality.

So, why doesn't the change in extension of the wheat show that extension is a secondary quality?

Locke's claim is that any divisions will not remove extension, or solidity, or shape, even if it alters those qualities.

These properties of the wheat contrast with the way objects lose all color in the dark, and the way that the wax can lose its odor and flavor.

The wheat still has a size and a shape, but, with enough division, the primary qualities may lose shape.

Do electrons have shape?

Certainly, the solidity of an object will change after enough division.

There are some serious worries here for Locke's primary/secondary distinction.

But the general idea should be clear.

Let's set these worries aside to how Locke applies the distinction.

VII. 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.

Putting skepticism aside, Descartes's strongest argument against the veridicality of sense experience relies on his examples of the wax and the sun in support of his rejection of the Resemblance Hypothesis.

While the primary/secondary distinction preceded even Descartes, we often associate the distinction with Locke because of his use of the distinction in his arguments for empiricism.

The distinction allows Locke to defend a weakened version of the Resemblance Hypothesis.

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.

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 significant conclusions about the world (i.e. the new science) without appealing to innate ideas.

Note that Locke and Descartes do not disagree substantially about the nature of the physical world. We should expect this, since both Descartes and Locke were writing in support of modern science. Descartes believes that the essential characteristic of physical objects is extension, whereas Locke believes that extension is just one of several primary qualities. They disagree about how we know about those properties. But their disagreement is epistemological, not metaphysical.

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 again 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, AW 334b).