25
Locke, *Essay* IV.i; ii.1-7,14; iii.1-14,17-18,21
Knowledge

Having completed his survey of the sources and types of our ideas in Books II and III of the *Essay*, Locke turned in Book IV to consider what we can know on the basis of these ideas. In Chapter i, he identified four main objects of knowledge. In Chapter ii he went on to identify three main sources of knowledge. In Chapter iii he considered which of the objects identified in Chapter i may be known by which of the sources identified in Chapter ii, and he commented generally on the limits of the different sources of knowledge.

Locke was particularly concerned to reach a decision about how we come to know which ideas may or may not coexist in a substance. His pursuit of this question led him to a number of sceptical conclusions, most notoriously one concerning our inability to determine whether material substances might also be capable of thought.

QUESTIONS ON THE READING

1. What are the only objects the mind can immediately contemplate?
2. What is our knowledge of the coexistence of ideas particularly concerned with?
3. Are we capable of having knowledge of objects that exist outside of the mind?
4. What considerations led Locke to maintain that when you merely remember having demonstrated a conclusion, but do not review the proof, you still have knowledge of that conclusion rather than mere belief?
5. What are the intervening ideas responsible for our remembered knowledge of the results of past demonstrations?
6. On what fundamental principle does our knowledge of all general propositions in mathematics depend? Why must we rely on this principle?
7. Can memory ever be mistaken?
8. Explain the difference between intuition and demonstration.
9. Can demonstration ever be mistaken?
10. What are we ultimately concerned with when we ask whether a particular idea in our minds corresponds to some object actually existing outside of us?
11. What effects can we intuit or demonstrate motion to be able to produce? What effects do we perceive it to produce?
12. If we were able to determine the primary qualities of the insensibly small parts of which bodies are composed, would we then be able to deduce what ideas those bodies are and are not able to bring about in us? Why or why not?
13. Upon what, ultimately, must we rely for our knowledge of what qualities and powers may coexist in any given substance?

NOTES ON THE READING

The nature of knowledge. Locke wrote the *Essay concerning human understanding* to determine what things might lie within or beyond our powers of knowledge. But by the end of Book III of that work, he had yet to saying anything about knowledge. He had only talked about ideas: about how they originally arise and how they may subsequently be modified by the mind. But having ideas is not the same thing as having knowledge. Before someone can have knowledge

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they have to think something that can be true or false. And the bare perception of ideas, even if they are very complex, is not the same thing as thinking something that can be true or false. All the same, the study of our ideas is an important preliminary to the study of knowledge. If all of our knowledge is based on experience, and all of our experience is just of our own ideas, then all our knowledge is going to be about our ideas. So if knowledge consists in saying things that can be either true or false, then knowledge is going to have to consist in saying things about our ideas. This is why, when Locke finally turned to the examination of our knowledge in Book IV of the *Essay*, he opened by defining knowledge as the perception of the connection and agreement or disagreement and repugnancy of our ideas.

As he himself admitted at the outset of *Essay* IV.iv, this may seem like an unacceptably restrictive account of what we can come to know. It is natural to think that any knowledge worth having ought to be knowledge of objects in the world around us, and that any system that restricts the scope of our knowledge just to the ideas floating around in our own heads is tantamount to scepticism or, worse, to some sort of idealism that would divorce us from reality and have us engage just with phantoms of our own brains.

But in saying that all our knowledge is just of the relations between our own ideas, Locke was far from divorcing us from reality. For Locke, ideas originally arise in us because our sense organs are affected by objects. And throughout our lives, it continues to be the case that the ideas that we conceive most vividly, and that draw our attention the most, are the ones given to us in perception as a result of the affection of our sense organs. We do not cook up these ideas in imagination. They are imposed on us from the outside. One of the most important of the relations among these perceived ideas is the relation of coexistence between ideas in a substance. This relation itself is not one we cook up in imagination; it is a feature of the way ideas are given to us in perception. We perceive the collections of coexisting ideas that we do because substances have certain real constitutions and because we are affected in particular ways by these real constitutions. Thus, even though all our knowledge may be restricted just to knowledge of the relations between our ideas, we need to think that insofar as these ideas are perceived, and insofar as the relations between them are relations of perceived coexistence, they are reflections of something real outside of us.

What makes an attention to the significance of the ideas we receive in perception particularly important is the fact that, in virtue of their real constitutions, objects have the power to benefit or harm us and so bring about ideas of pleasure and pain in us. Perceptions of bundles of ideas coexisting in a substance are therefore perceptions of something that can potentially benefit or harm us by bringing about yet other ideas of pleasure and pain in us. We can learn by experience that certain substances, identifiable by the characteristic bundles of coexisting ideas we receive from them, have powers to affect us in certain ways. For example, we can learn that fire has a power to burn us if we get too close or warm us if we get close enough. That, Locke liked to note, is something that makes those ideas in our heads that are of perceived substances as "real" as anything needs to be, and a due attention to relations of perceived coexistence of ideas in a substance as important for our happiness as any knowledge of objects in the world around us.

Relations of perceived coexistence of ideas in a substance are not the only relations of ideas that we are concerned to know, though they are the ones that are most important to us. There are other relations that figure in our more abstract, logical, and metaphysical knowledge: the relation of identity that each idea has with itself and of diversity that it has with all other ideas, as well as the relations of different sorts of similarity that different ideas bear to one another.

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Despite these facts, Locke was unable to abide by the view that our knowledge extends only as far as the perception of relations of identity, resemblance, and coexistence among our ideas. He went on to recognize a fourth type of knowledge that he characterized as consisting in the perception of "*actual real existence* agreeing to any *Idea*" (*Essay* IV.i.7). This is the kind of knowledge that I presumed to have a moment ago when I asserted that our perceptions of the coexistence of ideas in substances are caused by the real constitutions of objects existing outside of us and affecting our sense organs. Locke claimed to have this sort of knowledge in *Essay* II.viii.7-26, when he asserted that our type (i) ideas resemble primary qualities in objects.

That Locke should have claimed that we have this kind of knowledge may seem puzzling. After all, in the very first sentence of Book IV he wrote,

> Since *the Mind*, in all its Thoughts and Reasonings, hath no other immediate Object but its own *Ideas*, which it alone does or can contemplate, it is evident, that our knowledge is only conversant about them. [*Essay* IV.i.1]

But if our knowledge is only conversant about our ideas, then how can Locke be entitled to think that "conversing" about other things besides those ideas could constitute knowledge? And if our minds have no other objects than their ideas, then how can he here claim that we can go beyond those ideas and make claims about external things?

In Locke's defence, it is worth noting that, as puzzling as his claim to knowledge of "actual, real existence agreeing to any idea" may be, it is not explicitly inconsistent with *Essay* IV.i.1. To say that the mind has no other *immediate* object than its ideas does not rule out the possibility that it might have some other *mediate* object. And to say that all our knowledge is only conversant about our ideas does not rule out the possibility that one of the things we might say about our ideas is that they correspond to actually existing objects. That is still to "converse" about our ideas in a certain way.

But even if we cannot accuse Locke of an outright inconsistency we can still wonder what made him so sure that we have any knowledge of external things corresponding to our ideas.

Locke briefly considered this question in *Essay* IV.ii.14 and returned to it at greater length in *Essay* IV.xi.3-10. Over IV.ii.14 he confined himself to making two points. The first is that we are able to draw a distinction between perception on the one hand and imagination and memory on the other. There is a sensible difference between feeling the pain of a stubbed toe, which hurts, and merely remembering or imagining that pain, which does not. Our sensory experiences of colours, tastes, figures, and the like are similarly more vivid and detailed than those of memory or imagination.

Of course, answering the question of why we should suppose that we know of the existence of objects distinct from our ideas by remarking that there is distinction to be drawn between some of our ideas and others does not by itself address the question that was asked. But implicit in Locke's point is the thesis that we must suppose that the ideas that seem to come to us directly from sensory experience are caused by external objects whereas those that we remember or imagine are due to us. Later, over *Essay* IV.xi.3-10, Locke mentioned a number considerations that might be taken to support this hypothesis: we are aware that we ourselves have willed to produce a certain idea when we remember or imagine and can make this idea come and go at will, whereas the ideas we receive from sensory experience occur to us independently of our wills and can only be altered by willing motions of our bodies, not by directly willing the appearance or disappearance of the ideas. Moreover, were we ourselves responsible for producing the ideas we receive in sensory experience,

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those who have been blind since birth should be able to produce ideas of colours and those who have never tasted pineapple should nonetheless be able to generate ideas of this taste in themselves. Yet this is not the case. Finally, were we ourselves responsible for producing the ideas we receive from sensory experience, there would be no need for ideas of different sensory modalities to agree with one another. We could make ourselves see one shape while making ourselves feel another. Indeed, given the obvious limitations of our cognitive powers, we ought to expect that it would be impossible for us to preserve the degree of agreement between the information delivered by our different senses that those senses actually exhibit. We have only to consider how difficult it is to write a novel that gets the time-lines and the other details right and does not generate inconsistencies and then think that our sensory experiences are far more detailed than any novel to be convinced that nothing in us could make all those parts hang together so well.

This answer raises an immediate counter-objection: that the supposition that our sensory experiences are due to external objects is just a hypothesis, and not knowledge, and the contrary hypothesis that we ourselves may be responsible for the ideas we receive from our senses has not been adequately refuted by the considerations Locke mentioned. This is proven by the case of dreams, if by nothing else. Dreams can exhibit all the vivacity, coherence, and involuntariness, of sensory experiences, and they can arouse sensations of pleasure and pain that are indistinguishable from those had in waking life. Moreover, the objection that we ourselves could not be the causes of our ideas flies in the face of Locke's supposition that we are in fact the causes of our type (ii) ideas of sensible qualities, which have nothing in them resembling the objects Locke supposed to exist in the external world. And if we may cause these ideas, why could we be the causes of our type (i) ideas of primary qualities as well, particularly since we seem to be the cause of those ideas in cases of perceptual illusion?

Locke's answer to the dreaming argument (and the second of the points he was concerned to make in *Essay* IV.ii.14) was that as long as the objects we perceive can cause us pleasure or pain independently of our wills, then it does not matter whether they actually exist outside of us or not, since for all practical purposes they behave as if they did and we have to deal with them as if they did. If putting my hand in the dream image of a blast furnace will cause the same pain, and subsequently the same scarring and crippling, as doing the real thing, then the dream image is real enough. For all practical purposes we have to treat it as if it were produced by something that operates independently of us, and that will continue to pose a threat to us when we turn our backs to it and no longer perceive it. That is tantamount to considering the dream image to be produced by something that is distinct from us and that continues to exist when not perceived by us, that is, to considering it to be produced by an external object.

Locke accordingly dismissed the dreaming argument as ineffective and counted knowledge of real existence corresponding to our ideas among the types of knowledge we can obtain.

Having identified these main types of relation involving ideas, Locke went on in *Essay* IV.ii to discuss three means by which these various relations might come to be known: intuition, demonstration, and sensation.

Intuition. Intuition needs to be carefully distinguished from sensation. In sensation, as Locke here understood the notion, my senses are affected in such a way as to give me a perception, consisting of a number of ideas standing in a certain relation to one another. The relation is exhibited in the experience. For instance, the ideas might all be present together, so that the sensory experience exhibits the relation of their coexistence. Intuition is not like this. When I

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intuit a relation between ideas, those ideas are typically not ones I am now experiencing through my senses. They are more often ideas I have called up from memory, or modifications of ideas I have had in the past, or complex modes I have myself constructed from ideas I have had in the past, or simple ideas that I have abstracted from memory of their past surroundings. And the relation between these ideas will not be one that is exhibited in experience, since I may never, in the past, have had those ideas together in the same experience. The relation is rather one I discover by holding the two ideas before my mind's eye and comparing them with one another. Locke's idea was that this act of comparison should lead me to simply see or intuit that the ideas bear a certain relation to one another. It is by means of such "intuition" that I discern that white is not red, that orange is more like red than it is like white, that equals added to equals are equal, that cubes have six faces, that 2 + 3 = 5, and so on. In all these cases, my knowledge claim names certain ideas that I have and I discover the relation that holds between them simply by inspecting them, comparing them with one another, and directly and immediately seeing that they stand in that relation to one another.

The directness and immediacy of intuition deserve to be stressed. If a relation between ideas is truly intuited, it must be seen right away, upon first inspecting the ideas, and no doubt, hesitation, or difficulty can attach to that vision. If any does, the relation is not intuited. It is for this reason that Locke identified intuition as the most certain and indubitable form of knowledge that we can have.

It is worth noting in passing that Locke's notion of intuitive knowledge is not coextensive with the more recent notion of an analytic truth. An analytic truth is understood to be a proposition that is true by definition of the terms involved, or that is true because the subject concept contains the predicate concept. But propositions like, "orange is more like red than it is like white" are intuitions for Locke, even though they are not analytic. Orange, red, and white are simple ideas that cannot be defined and that each exhibits one uniform appearance that does not contain anything to be found in the other. Yet relations of similarity and dissimilarity can nonetheless be intuited as holding between them simply through comparing these ideas with one another.

Demonstration. The second means of knowledge Locke identified is demonstration. It is knowledge that is obtained by means of a chain of intuitions that serve as intermediate links, relating two ideas that cannot be directly intuited to be related to one another. Consider an example that might seem to some to be an intuition, but that I pick because it will offer a simpler illustration than a case that is uncontroversially demonstrative: the arithmetic truth that 3+4=7. (Some might think that they can just intuit this, the way we can intuit that 2+3=5 by inspecting the "five" side of a die and noting that it consists of a group of three and a group of two dots, but let us suppose that it is harder to do this with "3+4=7" and that a demonstration is required.) To demonstrate this principle we start off with the idea of three things added to four things. We know by intuition that three is the number that comes after two. So "3+4" is intuitively the same as "2+1+4." We also know by intuition that four is the number that comes before five. So "2+1+4" is the same as "2+5." We know by intuition that two is the number that comes after one. So "2+5" is the same as "1+1+5." We know by intuition that five is the number that comes before six. So "1+1+5" is the same as "1+6." And we know by intuition that six is the number that comes before seven, so "1+6" is the same as "7." Thus, here there is a chain of intermediate ideas linking the idea of three added to four with the idea of seven.


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3+4
2+1+4
2+5
1+1+5
1+6
7

Each earlier idea in the chain is intuitively equal to each later one, and the entire chain therefore constitutes a demonstration of the equality of the first idea with the last one.

Locke took the knowledge obtained by intuition to be certain and indubitable, and since demonstration is just a chain of intuitions it follows that what is known by demonstration must also be certain and indubitable. Yet we sometimes make mistakes in demonstration. Locke had a hard time reconciling this fact with the certainty he wanted to attribute to demonstration. At *Essay* IV.ii.7 he declared that errors can creep into a demonstration due to the fact that in long proofs we can often forget some of the steps. But if I forget a step in a demonstration I will not draw a wrong conclusion; I just will not be able to draw the conclusion I am aiming at. (Just as, if a premise is missing from an argument, I will not draw a wrong conclusion as long as I proceed logically, so here, if I clearly intuit whatever relations I can discern from those results I can remember, I should not be led into error.) It would seem, therefore, that if we are to make mistakes in demonstration then memory must not only fail to inform us but actually misinform us of results we have previously obtained.

However, implausible as it may seem, Locke was generally unwilling to countenance the possibility that our memories might misinform us. A clear memory should, in his opinion, put the question of the actual past occurrence of whatever is remembered past doubt (*Essay* IV.xi.11).

A rather different account of the causes of error in demonstration is to be gleaned from *Essay* IV.xiv.3. Locke there said that when we make errors it is because we do not perform a demonstration at all, but rather, due to time pressures, laziness, impatience, or stupidity, simply skim over a proof, without taking the time to assure ourselves that we actually intuit the relations of ideas at each step, or even skip over some steps that we could demonstrate if we put our minds to it.

> [We] often stay not warily to examine the Agreement or Disagreement of two Ideas, which [we] are desirous, or concerned to know; but either incapable of such Attention, as is requisite in a long Train of Gradations, or impatient of delay, lightly cast [our] Eyes on, or wholly pass by the Proofs; and so without making out the Demonstration, determine the Agreement or Disagreement of two Ideas, as it were by a view of them as they are at a distance, and take it to be the one or the other, as seems most likely to [us] upon such a loose survey.

In this connection, it is worth digressing to comment on a topic Locke himself discussed earlier, in IV.i. When writing the first three editions of the *Essay* Locke had considered the case of someone who arrives at a conclusion by merely remembering that he or she has demonstrated this result in the past, rather than by doing the demonstration again. He had declared at that time that this person could not have knowledge, but would only possess belief. For if the person had never performed the demonstration, but accepted the result simply because he or she had heard from someone else that the demonstration had been performed and had yielded the result, then we would think that he or she merely had a belief, based on trust in the testimony of this other person, and not

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knowledge. But this case is really no different. It is just that, in this case, the person is putting faith in the testimony of his or her memory rather than someone else.

However, in the fourth and subsequent editions of the Essay Locke changed his mind, apparently because he came to think that if a demonstration had to be reviewed on each occasion in order to be known, then it would be impossible to appeal to previously established results when giving a mathematical or geometrical proofs. Each result would have to be proven again on every occasion when it was invoked and would only be valid in the circumstances of that particular proof. This would make it impossible to give long proofs, where you cannot remember the reasons for the earlier results by the time you get to the later ones. To avoid this outcome, he declared that someone who remembers the result of a past demonstration is actually performing a new demonstration, though one of a different kind from the original one, and so has demonstrative knowledge and not mere belief. The new demonstration is the following: We know intuitively that immutable things do not change over time. (The idea of immutability just is the idea of being unchangeable.) But complex modes, such as numbers and geometrical shapes, are immutable, since they just are whatever we define them as being. Consequently, whatever has once been proven to be true of them must remain so for all time. And, therefore, it suffices to remember that something was earlier demonstrated to be true of a complex mode for us to now be assured, with the force of a demonstration, that the truth still holds.

But for this demonstration to be valid, we have to be assured that we are not misremembering when we think that we have proven the result in the past. Locke's commitment to the infallibility of memory assisted him here. "He remembers," Locke wrote of the person recalling the conclusion of a past demonstration, "*i.e.* he knows (for remembrance is but the reviving of some past knowledge)" (*Essay* IV.i.9).

Unfortunately, this is just wrong, as Locke himself admitted elsewhere. At *Essay* IV.ii.7 he acknowledged that "the Memory does not always ... exactly retain" each step in a long demonstration, suggesting that it sometimes retains a distorted and therefore incorrect representation of that step. As a consequence, his account of demonstration retains an inconsistency concerning the reliability of memory that he never adequately resolved.

Sensation. The third and final of the means of knowledge is sensation. In sensation ideas can be exhibited as standing in particular relations to one another. Most importantly for Locke, they can be witnessed to be coexistent. Since all of our simple ideas are distinct and can be considered apart from one another, no intuition and no demonstration however exhaustive, could ever lead us to come to know relations of coexistence of simple ideas. Yet these relations are very important, since the perception of the coexistence of simple ideas serves as a foundation for our ideas of substances. Moreover, as has already been noted, insofar as ideas of pleasure and pain are considered to be among the other ideas that coexist in a collection, they confer the status of a reference to real existence on that collection of ideas. This is why Locke identified sensation as being particularly responsible for our knowledge of real existence.

While Locke considered intuition, demonstration, and sensation to all be *certain* (they would not deserve to be considered means of knowledge if they did not give us certainty, but merely causes of belief), he did think that they are more or less *evident*. Our intuitions are immediately evident. However, it is only through going through the effort of performing or remembering a proof that a demonstrative proposition becomes evident. The more effort the demonstration requires, the less evident the proposition appears, even though it may be allowed to still be certain.

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Sensation is yet less evident than demonstration. Whereas doubts can be raised about the truths of demonstration prior to performing the demonstration, doubts about the existence of real objects corresponding to the substances we experience in sensation can persist in the face of the evidence supplied by the senses. It is just that Locke thought that these doubts are answerable, so that sensation still deserves to be considered a source of certainty and hence a type of knowledge.

Method. Having identified four main objects of knowledge, knowledge of the identity and difference of ideas, of their relations to one another, of their coexistence in substances, and of real existence corresponding to our ideas, and having identified three main means of obtaining knowledge, intuition, demonstration, and sensation, Locke turned in the third Chapter of Book IV to consider which means are most appropriate to knowing which objects. He made the following observations:

(i) the identity of ideas with themselves and the difference of ideas from one another are all known by intuition

(ii) some of the other relations that ideas bear to one another can be known by intuition, but others can only be known by demonstration and yet others can only be known by sensation. Relations concerning degrees of quality (for example, that the idea of light received from looking at the sun is brighter than that received from looking at a kitchen fire), or simple comparisons of quantity (that a dozen is more than a pair), or straightforward consequences and relations of nominal essences (that bachelors are unmarried males) can all be intuited by inspecting the related ideas. However the relations between different geometrical figures, large numbers, and the interconnections of complex modes such as those involved in discussions of ethics and politics can often only be known by demonstration. And certain kinds of relations, notably those having to do with what things are located alongside what other things in space or what things occur before or after what things in time, can only be known by sensation.

(iii) relations of coexistence can only be known by intuition or demonstration under special circumstances.

(iii.a) In general, the fact that two ideas coexist is not something that can be known by simply intuiting the two ideas and comparing them with one another. The fact that white and sweet coexist in sugar, for instance, cannot be intuited by inspecting the idea of white and finding sweet contained in it, the way that the claim that all cubes have six faces can intuited by taking the idea of a cube and inspecting it and finding the six faces right there in the idea. The togetherness of white and sweet in sugar is not intuited, but perceived — discovered by having those ideas in fact given together in the experiences of sugar that we have. Locke was emphatic about this point in *Essay* IV.iii.10:

> the simple *Ideas* whereof our complex *Ideas* of Substances are made up, are, for the most part such, as carry with them, in their own Nature, no visible necessary connexion, or inconsistency with any other simple *Ideas*, whose co-existence with them we would inform our selves about.

The only real exceptions to this observation are based on technicalities. If two ideas are contained in the nominal essence of a substance then their coexistence is known by intuiting that they are both included in the definition of the nominal essence of the substance. For example, if the nominal essence of lead is “soft, gray metal” then I can know by intuition that the ideas of softness and a gray colour coexist in lead. However, that any given substance that actually exists should

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answer to this nominal essence, and hence, that those two ideas are to be found together anywhere in nature, is still something that can only be known by sensation.

(iii.b) If an idea can be deduced from the ideas that can actually be determined by sensation to coexist in a substance, then the coexistence of that idea with any of the ideas that sensation reveals to be present in the substance, or with any other idea that can be deduced from the nominal essence, can be known by demonstration. For example, if the nominal essence of lead is "soft, gray metal" then it can be deduced from this nominal essence that if a ball of lead is forcibly thrown to the floor it will be dented. And as a consequence, if any ball of soft, gray metal is encountered in experience, it can be deduced that that particular ball of metal will receive a dent when thrown to the floor.

However, demonstrations like this are in general only possible where the primary qualities of a substance are concerned. In these cases, a kind of mechanical reasoning from laws of motion and collision, assisted by our knowledge of the laws of geometry and mathematics, can allow us to deduce what aggregate structures will be built up by collisions of what types of particles, how the internal architectural structure of those structures will lead them to behave (e.g., whether they will be capable of compression or piercing), and how those structures will be able to move other structures. (This is the kind of demonstration engaged in by engineers when designing mechanical devices.)

But this is usually not the case. Most of the simple ideas we get from substances do not resemble anything that actually exists in the substance but merely refer to powers that it has. (Sugar is not actually white or sweet, but merely has a power to bring about these ideas in us.) Even our ideas of extension and solidity only represent the gross, macro-structure of substances, and not the micro-structure of their small parts. Thus, the substance's real nature is hidden from us behind a veil of non-resembling ideas and gross, imprecise resembling ideas. Not knowing what the micro-structure of substances really is, we can hardly expect to be able to deduce or predict what sorts of qualities and powers it will manifest beyond the ones we are actually able to perceive.

But even if we could discover what the micro-structure of substances is, this would not be of much help us in demonstrating what other simple ideas the substance might give to us. To be able to predict what colour sugar will turn when heated, for instance, we would not only have to know what the micro-structure of sugar is and how this micro-structure is affected by heat, we would also have to understand the connection between the micro-structure of substances and the non-resembling ideas that micro-structure causes in us. As long as we cannot understand why one micro-structure produces ideas of white, another of red, we will not be able to determine what sorts of colour ideas would be caused in us were the micro-structure altered.

This means that the coexistence of secondary qualities in a substance, that is, the presence of a particular collection of powers to bring about various type (i), (ii) and (iii) ideas in us, can never be demonstrated from a knowledge of the nominal essence of that substance. Were these powers explicitly included in the nominal essence, then, indeed, they could be directly *intuited* to be part of that nominal essence. But if they are not so included, then they could not be demonstrated from the nominal essence, or, indeed, even from a knowledge of the real constitution of the substance. The only way their coexistence in the substance could be known is by sensation, that is, by actually experiencing that the ideas we take to result from those powers occur together in us when we experience the substance.

Similarly, the coexistence of tertiary qualities in a substance, that is, the coexistence of various powers to bring about changes in other substances, or undergo changes in the presence of other

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substances, could not be demonstrated if the changes in question involve alterations of sensible qualities. Powers to alter primary qualities might be demonstrated, if enough is known about the primary qualities in the substance responsible for giving the substance those powers, but tertiary qualities are evidenced only by changes in the sensible qualities of substances.

Thinking Matter. Locke's meditations on this result led him to digress in *Essay* IV.iii.6 to make an offhand remark that initiated a decades-long intellectual controversy: the "thinking matter" controversy.

The remark was inspired by Locke's reflection that our inability to demonstrate the coexistence of the powers in a substance applies to our knowledge of our own substance (or substances).

We have ideas of our own bodies. These ideas are ideas of a certain arrangement of solid, shaped, moving parts in the form of an organic structure suited to carry out the life functions of nutrition, growth, reproduction, and locomotion. On the supposition that type (i) ideas of solidity, extension, and their modes resemble primary qualities actually existing in bodies, we take our ideas of our bodies to result from some arrangement of solid, extended, moving parts that has a power both to bring about ideas of its solidity, extension, and motion in us, and to carry out the life functions.

However, we also have ideas of ourselves as thinking, willing, beings. That is, we have ideas of a power of sensation and a power to initiate motion that we ascribe to ourselves.

According to Descartes and other dualists, these two sets of ideas are ideas of the qualities and powers of two distinct substances, one material, one spiritual, that happen to be attached to one another in some mysterious way. But why should we think this? If we cannot deduce what type (ii) ideas may result from what primary qualities of a body, with what right could we *deny* that the ideas of a power of thought and motion may be produced in us by a substance that has the qualities of solidity and extension?

Such a denial could not be based on sensory experience, since sensory experience appears to inform us that volition and thought coexist in the same place as the solid, extended parts of our bodies. Of course, we might say that there are really two, distinct substances coexisting in this place, one spiritual, one material, but while we might *say* this, how could we *know* it?

In the absence of a clear indication from sensation, the only way we could know that thought and volition could not coexist in the same substance as solidity and extension would be by either intuiting or demonstrating that these two sets of qualities and powers are incompatible. But it is not intuitively obvious that thought and volition could not coexist in the same substance as solidity and extension, or at least, there is no more of an intuitively obvious incompatibility between thought and solidity or volition and extension than there is between a colour and a temperature, or a colour and a power to melt wax.

Neither, according to Locke, is it demonstratively obvious that these qualities are incapable of coexisting. This is hard to prove. When someone wants to prove that there *is* a demonstration of something they have an easy recourse: they need simply give the demonstration. But someone who wants to prove that there is *no* demonstration is faced with a much harder task. They cannot establish their point by simply refusing to give a demonstration, because it could be objected that a demonstration may possibly exist, but they are not ingenious enough to discover it. Thus, Locke was faced with a challenge when he claimed that there could be no demonstration of the incompatibility of thought and volition on the one hand, and solidity and extension on the other. To justify his position, he employed a technique that might be called setting a precedent. That is, he

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showed that we do not think that there is any incompatibility in a closely associated case. By parity of example, therefore, we ought not to recognize an incompatibility in this one.

Locke observed that we think we receive ideas from our senses. We do not, that is, suppose that our minds fly out of our heads and join with the objects outside of us to perceive them in the places where they are. We instead suppose that objects reflect or transmit a stream of particles that hit our sense organs, thereby bringing about changes in our central nervous systems and brains that produce ideas in our minds. But anyone who thinks this must admit that motions of solid, extended parts are somehow able to cause ideas. Yet it is inconceivable how motion could produce anything other than motion. If the fact that we cannot conceive how solid moving parts could produce ideas in us is no impediment to our supposing that these parts are nevertheless somehow able to do just that, then, by parity of example, Locke charges, the fact that we cannot conceive how solid moving parts could have powers of thought or volition should not prevent our allowing that God could, if he wanted, have joined powers of thought and volition to such parts.

It should be stressed that Locke did not mean to endorse materialism. His position was that the question of the substance of the soul is beyond our powers of knowledge. He claimed that the manner in which something material, possessed only of extension, motion, and solidity, could constitute or have a sensation is quite incomprehensible. But so equally is the notion that something immaterial, joined to a material body should be able to communicate with this body without being solid and so able to give or receive impacts. As long as each party tries to defend their position merely by pointing out the absurdities in the opposing view, they triumph. But the fact is that both positions are equally absurd and that the relation between thought and will on the one hand, and extension and solidity on the other is completely obscure to us.

Rational Morality. Locke's position on thinking matter is perhaps the best example of how his account of human understanding and its limitations furthered the aims of liberalism and toleration, by undermining the claims of entrenched religious authorities to absolute certainty regarding their doctrines. But it was not the only part of *Essay* IV that contributed to this goal. When discussing how we can know relations by demonstration, Locke insisted that morality, which deals with complex modes like justice, duty, right, promise, citizen, and sovereign, is capable of demonstration in just the way that mathematics and geometry are. This flew in the face of the view that morality is ultimately founded in religion and the commands of God, and suggested that what a person needs to be moral and to be a good citizen is not piety, but simply rationality and strength of will — an ability to intuit and demonstrate certain basic relations of ideas and then to act upon the consequences of those intuitions and demonstrations.

ESSAY QUESTIONS AND RESEARCH PROJECTS

1. According to Locke, all ideas arise from experience. But not all *relations* between ideas are known by experience, that is, by having an experience in which two or more ideas are simultaneously presented and exhibited as standing in a certain relation to one another. Some relations between ideas are discerned by remembering the related ideas, comparing them with one another, and "intuiting" that they stand in a certain relation, without ever having had an experience where all the related ideas are simultaneously presented. It is for this reason that Lockeian "intuitive" knowledge has been considered to be a form of "*a priori*" knowledge. (*A priori* knowledge is knowledge obtained independently of experience — in this case, knowledge of a relation between two things obtained

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independently of having experienced those two things together.) *A priori* knowledge is controversial. Many have doubted that there could be such a thing, and those who accept it are not agreed on what makes it possible. Do a survey of recent work on what makes *a priori* knowledge possible. Might any of the recently advocated positions on *a priori* knowledge be read back into Locke?

2. It has been charged that Locke's view of intuition involves a commitment to innate knowledge of just the sort that he proposed to reject in Book I of the *Essay*. According to this objection, our ability to simply intuit that there is a relation between certain ideas is a function of our innate constitution. Some propositions, such as that cubes have six faces, may appear intuitively obvious to us, but not to other creatures, and things that we are only able to know through a complicated demonstration, such as that there are only five Platonic solids, may be intuitively obvious to others beings. Worse, some of our intuitions may be deceptive. Do a survey of recent work on Locke's account of intuition and assess the strength of this objection in light of how recent commentators on Locke have dealt with it.
3. Locke maintained that knowledge obtained by demonstration is certain. Yet we often make mistakes in demonstration and think we have demonstrated conclusions when we haven't. Did Locke have anything to say about how this is possible? Note that the answer to reading question 7 speculates about this. Do a more extensive study of whether this answer (or some other) is consistent with everything Locke said about demonstration and the role of memory in demonstration.
4. The difficulties created by our need to rely on memory in giving demonstrations are among the reasons that motivated Hume to declare that the conclusions of a demonstration are merely probable and so cannot constitute knowledge. In Book I, Part iv, Section 1 of his *Treatise of human nature* Hume appealed to this fact to mount a notorious argument against reasoning. Outline Hume's argument and assess its adequacy.
5. One problem with Locke's account of demonstration is that it breaks down in cases where ideas stand in intransitive relations to one another. (A transitive relation has the following property: for any three things, A, B, and C, if A stands in the relation to B, and B stands in the relation to C, then A stands in the relation to C. Equality is such a relation.) For example, I can intuit that A closely resembles B and that B closely resembles C, but I might be wrong to take this to constitute a demonstration that A must closely resemble C. How might Locke have dealt with this problem?
6. Assess the adequacy of Locke's attempt to prove that sensation gives us *knowledge* (as opposed to mere *belief*) in the existence of external objects. (Consider what he has to say on this topic in *Essay* IV.xi as well as IV.ii.14.) Has he even established that sensation gives us belief?
7. Identify and study the main contributions to the late 17th and early 18th century English debate over thinking matter. Identify the most compelling arguments formulated for and against the possibility that matter might think. Note that Locke adopted something of a half-way position on this debate insofar as he maintained that thought could not originally pertain to matter, though it could be added to it by an act of God (see, for instance, *Essay* IV.x.10). Determine whether Locke's half-way position is at all consistent.

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