

# An Essay Concerning Human Understanding

## Book II: Ideas

John Locke

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[Brackets] enclose editorial explanations. Small ·dots· enclose material that has been added, but can be read as though it were part of the original text. Occasional •bullets, and also indenting of passages that are not quotations, are meant as aids to grasping the structure of a sentence or a thought. Every four-point ellipsis . . . . indicates the omission of a brief passage that seems to present more difficulty than it is worth. Longer omissions are reported on, between [brackets], in normal-sized type.

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## Chapter xiii: Simple modes, starting with the simple modes of space

**1.** I have often mentioned simple ideas, the materials of all our knowledge, focussing on how they come into the mind. Now I shall discuss some of them with a different focus: this time it will be on how they relate to ideas that are more compounded, looking into the different modifications of the same idea—modifications that the mind either finds in real things or makes up on its own initiative. [A ‘modification’ of a quality is a special case of it, so squareness is a modification of rectangularity (see viii.23); and by a natural extension of that usage, the idea of squareness can be called a modification of the idea of rectangularity.] Those modifications of a single simple idea (which I call *simple modes*) are as perfectly different and distinct ideas in the mind as those that are utterly unlike or even contrary to one another. For •the idea of *two* is as distinct from that of *one* as *blueness* is from *heat* or as either of those is from any *number*; yet •it is made up only of repetitions of the simple idea of a unit. Repetitions of this kind joined together make the distinct simple modes of a dozen, a gross, a million.

[Section **2** merely repeats the point Locke has made in v, that ‘we get the idea of space both by our sight and touch’.]

**3.** Space considered in terms purely of length between any two things, without considering anything else between them, is called *distance*; if considered in terms of length, breadth, and thickness I think it may be called *capacity*. The term *extension* is usually applied to it whatever manner it is considered in, •whether in terms of one or two or three dimensions•.

**4.** Each different distance is a different modification of space; and each idea of any distance is a simple mode of this idea. . . . We have the power of repeating any idea we have of some

distance, and adding it to the first idea as often as we like, without being ever able to come to any stop. That lets us enlarge it as much as we like, which gives us the idea of *immensity* [= ‘infinite size’].

**5.** There is another modification of this idea, which is nothing but the relation that the parts of a boundary have to one another. In perceptible bodies whose surfaces come within our reach, this relation is revealed by the sense of *touch*; and the *eye* learns about it from bodies and from •expanses of• colours whose boundaries are within its view. •Observing how the boundaries terminate either in straight lines that meet at discernible angles or in crooked lines in which no angles can be perceived, •and considering these as they relate to one another in all parts of the boundaries of any body or space, the mind has the idea that we call *shape*, which presents it with infinite variety. For besides the vast number of different shapes that really exist in coherent masses of matter, the mind has the power to make perfectly inexhaustible additions to its stock of ideas, by varying the idea of space and thereby making new compositions. It can multiply shapes ad infinitum, by repeating its own ideas and joining them as it pleases.

[Section **6** continues with the theme of our freedom to make ideas of any shapes we like, whether encountered in reality or not; and adds that we can also form ideas of lengths or distances that are as long or as short as we please.]

**7.** Another idea that belongs in here is the one we call *place*. Whereas in simple *space* we consider the relation of distance between any two bodies or points, in our idea of *place* we consider the relation of distance between •some thing and

•any two or more points that are considered as staying at the same distance from one another and thus as staying at rest. When we find a thing at the same distance now as it was yesterday from two or more points that haven't changed their relative distance in the interim, we say it has 'kept the same place'; whereas if it has perceptibly altered its distance from either of those points we say that it has 'changed its place' . . . .

**8.** The idea of a thing's *place* is relative, in a manner I now explain. If we find the chess-men on the same squares of the board that they were when we left them, we say they are all in the same place, or unmoved, even if the board has been carried from one room into another. That is because we relate them only to the parts of the chess-board, which stay at the same distance from one another. The board, we also say, is in the same place as before if it remains in the same part of the cabin, even if the ship has been sailing on; and the ship is said to be in the same place if it keeps the same distance from the parts of the neighbouring land, even though the earth has rotated. So chess-men, board, and ship have each changed place in respect of more distant bodies that have kept the same distance from one another. . . .

**9.** This modification of distance that we call *place* was made by us for our own use, and we fit it to our convenience. When men speak of the 'place' of a thing, they do it by reference to those adjacent things *that best serve their present purpose*, ignoring other things that might be better determinants of place for another purpose. When we are playing chess, it wouldn't suit our purpose to locate the pieces in relation to anything except the squares on the board; but quite different standards apply when the chess-men are stored in a bag and someone asks 'Where is the black king?' and the right answer is 'In the captain's cabin'. Another example: when

someone asks in what place certain verses are, he doesn't want an answer that names a town or a library or a shelf; he wants an answer such as: 'They are at about the middle of the ninth book of Virgil's *Aeneid*', which remains true however often the book has been moved. . . .

**10.** Because our idea of place is merely that of a thing's relative position, we can have no idea of *the place of the universe*, though we can of any part of it. We have no idea of any fixed, distinct, particular beings, in reference to which we can imagine the universe to be related by distance. On the contrary, beyond it there is only one uniform space or expansion in which the mind finds no variety, no marks. To say that the world *is somewhere* means merely that it *does exist*. . . . Someone who could find out and form a clear idea of *the place of the universe* would be able to tell us—as in fact obviously nobody can—whether the universe moves or stands still in the undifferentiated emptiness of infinite space! . . .

**11.** Some philosophers—led into this by Descartes—maintain that *body* and *extension* are the same thing. One might think they have changed the meaning of one of the words; but I doubt that, because they have so severely condemned others for relying on uncertain meanings and on the deceitful obscurity of doubtful or meaningless words. Well, then, if they mean by 'body' and 'extension' the same as other people do, namely:

*body*: something that is solid and extended, whose parts are separable and movable in different ways;  
*extension*: the space that lies between the extremities of those solid cohering parts, and which is possessed by them [these are Locke's exact words],

then they are confounding two very different ideas with one another. Isn't it clear to us all that the idea of *space* is as

distinct from that of *solidity* as it is from the idea of *scarlet colour*? Solidity can't exist without extension; but neither can scarlet colour exist without extension; this doesn't prevent the ideas from being distinct from one another. Many ideas require, as necessary to their existence or conception, *other* ideas, ones that are entirely distinct from them. Motion can't be or be conceived without space, but motion is not space. Equally distinct from one another, I think, are the ideas of space and solidity and, therefore, the ideas of space and of body. That follows because: solidity is so inseparable an idea from body that the latter depends on the former for its filling of space, its contact, impact, and communication of motion on impact. If we can—as some Cartesians do—infer that •mind is different from body from the premise that •thinking doesn't include the idea of extension in it, we should be able by parity of argument to conclude that •space is not body, because •it doesn't include the idea of solidity in it. Here are three reasons why *body* and *extension* are two distinct ideas.

**12.** First, extension doesn't include solidity or resistance to the motion of body, as body does.

**13.** Secondly, the parts of pure space are inseparable from one another; so that the continuity can't be broken up—either really or in thought. One couldn't possibly break up a region of space into two separated parts, with two surfaces where there had been a continuity; and the very *thought* of such a separation is impossible, being inconsistent with the idea of pure space.

I am not denying that one can consider a portion of space—say a cubic foot of it—without considering the rest; but that is a partial consideration, not a mental separation, which is something different. . . . One may consider light in the sun without its heat, or mobility in a body without

its extension, without thinking of their separation—that is, without thinking of the sun as cold or of the body as unextended. . . .

**14.** Thirdly, the parts of pure space are immovable, which follows from their being inseparable, because motion is nothing but change of distance between any two things, and this can't happen between parts that are inseparable.

Thus the established idea of simple space distinguishes it plainly and sufficiently from body, since its parts are *inseparable, immovable, and without resistance to the motion of body*—whereas none of these is true of body.

**15.** If anyone asks me, *What is this space you speak of?* I will tell him when he tells me what his extension is. For to say, as is usually done, that being extended is having *parts outside parts* [Locke puts it in Latin] is to say only that *extension is extension*. I learn nothing about the nature of extension when I am told 'Being extended is having extended parts that are exterior to extended parts'. Compare 'What is a fibre?' is a thing made up of several fibres!'. . . .

**16.** Those who contend that space and body are the same challenge us with a dilemma—that they learned from Descartes. Either space is something or it is nothing; if we say it is nothing, then they reply that in that case two bodies cannot be separated by it, because if there is nothing between two bodies they must touch one another. But if instead we say that space is something, they demand that we tell them whether it is body or mind. I answer their question with a question: who told them that there could be nothing but solid beings that can't think, and thinking beings that aren't extended?. . . .

**17.** If someone asks (as people usually *do*) whether space with no body in it is substance or accident [here = 'property'], I

answer: I don't know, and I shan't be ashamed to admit my ignorance until the challengers show me a clear distinct idea of substance. ·I shall stay with 'substance' for the next three sections, returning to space in section 21a·.

**18.** I do my best to avoid the fallacies that we tend to fall into when we take words for things. It doesn't help our ignorance when we *pretend* to have knowledge by making meaningless noises. Made-up names don't alter the nature of things, and unless they stand for definite ideas they don't enable us to understand things either. Those who lay so much stress on the sound of the two syllables *substance* should ask themselves what is going on when they apply this word to •the infinite incomprehensible God, to •finite spirits, and to •body. Do they apply it in the same sense? Does it stand for the same idea when each of those three so-different beings are called substances? If it is, does it follow that God, spirits, and body, agreeing in the same common nature of *substance*, differ only in having different modifications of it, comparably with how a tree and a pebble are alike in having the common nature of *body* and differ only in having different modifications of it? That would be very hard to swallow. If instead they say that they apply 'substance' to God, finite spirit, and matter in three different meanings, expressing three different ideas, they ought to make known what those distinct ideas are, or at least to give them three different names, to prevent the confusion and errors that will naturally follow from the promiscuous use of such a suspect term. So far from its having three different meanings, in ordinary usage 'substance' scarcely has *one* that is clear and distinct! . . .

**19.** The philosophers who first rushed into the notion of *accidents*, as a sort of real beings that needed something to inhere in, were forced to find out the word 'substance'

to support them. [In this context an 'accident' is a property-*instance*. Locke is accusing his opponents of some such thought as this: 'In this ball that I hold in my hand there is sphericity, rubberiness, softness, a certain smell, and so on; that is, there are *this ball's instances* of those general properties; but there must also be something that *has* them, something that they are properties *of*. That must be a substance.'] Consider the poor Indian philosopher who imagined that the earth also needed something to hold it up. If only he had thought of this word 'substance', he wouldn't have needed to find an elephant to support the world and a tortoise to support the elephant: the word 'substance' would have met his needs! That would have been as good an answer to *his* question as it is to the question of our European philosophers who ask what supports a thing's accidents, and answers that it is 'substance'. We have in fact no idea of what substance *is*, but only a confused obscure one of what it *does*, ·namely, it supports accidents·.

[In section **20** Locke continues his attack on 'substance', ending with this sarcastic jibe against the view that accidents must *inhere* in a *substance*:] If the Latin words *inhaerentia* and *substantia* were put into the plain English that translates them—'sticking on' and 'under-propping'—it would be easier for us to see the very great clearness there is in the doctrine of substance and accidents, and show how useful they are in deciding of questions in philosophy.

**21a.** [Through a mistake in the original work, this section and the next were both labelled '21'.] Returning now to our idea of space ·and to the wrongness of identifying it with our idea of body·: I think everyone will agree that there is not an infinite extent of matter ('body') in the universe. Well, then, if a man were placed by God at the edge of the world of bodies, could he stretch his hand beyond his body? If he could, then he would put his arm where there had previously been space without

body; and if he spread the fingers of his outstretched hand, there would be space between them without body. If on the other hand he *couldn't* stretch out his hand, that would have to be because of some external obstacle; and then I ask whether that obstacle is substance or accident, something or nothing? When they (·the Cartesians·) have settled *that*, they will be able to settle what it is that •can be between two bodies at a distance and •is not body itself and •has no solidity. Anyway, this line of thought ·about *nothing*·:

If a body is put in motion and *nothing* hinders it (as would be the case beyond the utmost bounds of all bodies), it can continue to move,

is at least as good as this one:

If there is *nothing* between two bodies, they must touch one another.

·Really the former is better than the latter, for· •pure space between two bodies is sufficient to block the inference to their being in contact with one another, whereas •bare space in the way isn't sufficient to stop motion. In fact, these men must either admit that they think body to be infinite (though they don't like saying this aloud) or else affirm that space isn't body after all. A thoughtful person can no more have the thought of a boundary to space than he can think of a limit to time; if anyone's idea of eternity is infinite, so is his idea of immensity; either time and space are both finite or they are both infinite.

**21b.** Furthermore, those who assert the impossibility of space existing without matter must not only make body infinite but must also deny that God has a power to annihilate a part of matter. Presumably no-one will deny that God could put an end to all motion, keeping all the bodies in the universe completely immobile for as long as he pleased. Well, then, if you allow that God could, during such a period of

universal rest, annihilate the book you are now reading, you must also admit the possibility of a vacuum, for the space that was filled by the annihilated book would still exist, and would be a space without body. For the surrounding bodies, being perfectly still, make a diamond-hard wall through which no other body can possibly get in.

Indeed, the supposition of plenitude—·i.e. that the universe is full·—has the consequence that if a particle of matter is removed another particle must move in to take its place. But ·plenitude is only an unsupported supposition, which· needs some better proof than a *supposed* matter of fact which experiment can never establish. ·And it can't be accepted on conceptual rather than matter-of-fact grounds, for· our own clear and distinct ideas plainly satisfy us that there is no necessary connection between space and solidity, since we can conceive the one without the other. [Locke then repeats a point from iv.3: anyone who joins in the debate over plenitude as a matter-of-fact issue thereby commits himself to having distinct *ideas* of space and of matter or body.]

**22.** Without thinking about the edge of the material world, and without appeal to God's omnipotence, we get evidence for the existence of a vacuum from the motion of bodies that we see in our own neighbourhood. I defy anyone to divide a solid body so as to make it possible for the solid parts to move up and down freely every way within the bounds of that surface, without leaving in it an empty space as big as the smallest part into which he has divided the body. [Locke goes on to say, with some eloquence, that this reasoning applies at any size-level you care to choose.]

**23.** But my topic was the question whether the idea of space or extension is the same as the idea of body; and to answer No to this it isn't necessary to prove the *real existence* of a

vacuum. All that is needed is that we have the *idea* of it, and it is plain that men have that—i.e. the idea of vacuum, or space without body—when they argue about whether or not there is a vacuum. If they didn't have the idea of space without body, they couldn't make a question about its existence. . . .

[In section **24** Locke offers a suggestion about *why* the Cartesians made their mistake. (The better Cartesians, that is; he is rude about the others.) By sight and by touch, he says, the extension of bodies is forced in on us all the time, so it has come to dominate the thinking of the Cartesians, seducing them into thinking that none of the other properties of bodies could exist in the world except as properties of extended things. He concludes:] If they had reflected on their ideas of •tastes and smells, as much as on those of •sight and touch, they would have found that the former didn't include in them any idea of extension. Extension is just one affection [= 'property'] of body—one among others—and it is discoverable by our senses, which are hardly acute enough to look into the pure essences of things. The Cartesian view, remember, is that extension is *the whole essence of body*.

[Section **25** presents a mild philosophical joke: the sort of thinking the Cartesians seem to have done should lead one to conclude that '*unity* is the essence of every thing' because every thing is an instance of it—i.e. is *one*.]

[In section **26** Locke repeats his main case against the Cartesian view. He also mentions, but doesn't answer, the question of whether space is •'only a relation resulting from the existence of other beings at a distance' or whether instead it is •a kind of container. He declines to take sides on that question. He ends by suggesting some terminology, including this:] To avoid confusion it might be helpful if the word 'extension' were applied only to matter, or the distance

between the boundaries of particular bodies, and the term 'expansion' were used for space in general, with or without solid matter possessing it. . . .

**28.** That last suggestion points to a more general issue that will loom large in Book III, but which warrants one section here. Knowing precisely what our words stand for would, I imagine, quickly end this dispute and very many others. For I am inclined to think that when men come to examine their simple *ideas* they find them generally to agree, though in conversation they may confuse one another by using different *names*. I imagine that men who abstract their thoughts from the words in which they express them, and examine well the ideas of their own minds, can't differ much in their •thinking, however much they may puzzle one another with •words, which they use according to the ways of speaking of the various schools or sects they grew up in. Though amongst unthinking men who don't scrupulously and carefully examine their own ideas, and don't peel them off from the words men use for them, but rather confound them with words, there is bound to be endless dispute, wrangling, and jargon; especially if they are learned bookish men who are devoted to some sect, and have learned to parrot its way of talking. But if any two *thinking* men really had different ideas, I don't see how they could converse or argue one with another.

Don't misunderstand me. The sort of ideas I am speaking of don't include every floating imagination in men's brains. It isn't easy for the mind to put off those confused notions and prejudices it has absorbed from custom, carelessness, and ordinary talk. It requires trouble and concentration for the mind to examine its ideas far enough to resolve them into the clear and distinct simple ideas out of which they have been compounded, and to see which of its simple ones have a necessary connection with which others. . . .

## Chapter xiv: Duration and its simple modes

1. There is another sort of distance or length the idea of which we get not from the permanent parts of *space* but from the fleeting and perpetually perishing parts of *succession*. This we call *duration*; its simple modes are the different lengths of it of which we have distinct ideas—hours, days, years, etc., and time and eternity.

2. A great man—St. Augustine—when asked by someone what time is, answered: ‘When you don’t ask me, I know what it is’ [Locke gives this in Latin], which amounts to this: ‘The more I set myself to think about it, the less I understand it.’ This might lead one to think that time, which reveals all other things, is itself not to be discovered. Duration, time, and eternity are plausibly thought to have something very abstruse in their nature. But if we trace these ideas right back to their origins in *sensation* and *reflection*, one of *those* will be able to make these ideas as clear and distinct to us as many others that are not thought to be so obscure. Among other things, we shall find that the idea of *eternity* itself is derived from the same origin as the rest of our ideas.

3. To understand *time* and *eternity* correctly, we should attend to the nature of our idea of *duration*, and to how we came by it. Anyone who observes what happens in his own mind must realize that there is a sequence of ideas constantly following one another in his mind, as long as he is awake. Reflection on these appearances of various ideas one after another in our minds is what provides us with the idea of *succession*; and the distance between any two parts of that sequence, or between the appearance of any two ideas in our minds, is what we call *duration*. For while we are thinking, or while we receive successively various

ideas in our minds, we know that we exist; and so we call the existence (or the continuation of the existence) of ourselves our ‘duration’. We also speak of the duration of other things that coexist with our thinking.

4. We don’t perceive duration except when we attend to the sequence of ideas that take their turns in our understandings; which convinces me that our notion of succession and duration comes from *reflection*. [When Locke writes a phrase like ‘a succession of ideas’, this text replaces ‘succession’ by ‘sequence’. In phrases like ‘our notion of succession’, the word ‘succession’ is left alone.] When the sequence of ideas ceases, our perception of duration ceases with it—as everyone finds from his own experience of sleeping for any period of time, long or short. While he is sleeping and not thinking, he has no perception at all, and the duration of his sleep is quite lost to him; there seems to him to be no temporal distance from the moment he stops thinking to the moment he starts again. I am sure that it would be just like that for a man awake, if he could keep only one unvarying idea in his mind. We do in fact see that someone who fixes his thoughts very intently on one thing, not attending much to the sequence of ideas that pass in his mind, lets slip out of his account a good part of that duration and thinks the time that has passed is shorter than it really is. [Locke adds the point that even a sleeping man retains a sense of time passing if he dreams; which he takes as confirmation of his view.]

5. Someone who has in this way acquired the notion or idea of duration, can apply it to things that exist while he isn’t thinking; just as someone who has acquired the idea of extension from bodies through his sight or touch can apply

it to distances where no body is seen or felt. That enables a man to judge how much time has passed while he was asleep and not dreaming. Having observed the revolution of days and nights, and found the length of their duration to appear regular and constant, he can suppose that this revolution went on in the same way while he was sleeping as it did at other times, and this will give him a measure of how long he slept. But if Adam and Eve (when they were alone in the world), instead of their ordinary night's sleep, had passed a whole twenty-four hours in one continued sleep, the duration of those twenty-four hours would have been irrecoverably lost to them.

**6.** If you think that we get the notion of succession from •sensation rather than •reflection, then consider this: the motion of external bodies produces an idea of succession in your mind only to the extent that it produces there a continued series of distinguishable ideas. A man becalmed at sea may look on the sun, or the sea, or his ship for a whole hour, during which time two and perhaps three of those objects have moved, but because •he hasn't perceived their motion he doesn't get from them any sense of duration, .i.e. of time passing. But if during this hour of quiet he has been thinking, •he will perceive the various ideas of his thoughts appearing one after another in his own mind, and thereby find *succession* where he could observe no *motion*.

**7.** I think this is why very slow uniform motions are not perceived by us. In such a case, the change of relative distance is so slow that it causes no new ideas in us—or only ones that are widely separated in time—and so we don't have a constant series of new ideas following one another immediately in our minds, and thus have no perception of motion. . . .

**8.** On the other side, things that move very swiftly are also not perceived to move. It is because they don't affect the senses distinctly with the distinguishable distances of their motion [the last five words are Locke's], and so don't cause any sequence of ideas in the mind. When we see a thing moving around in a circle in less time than our ideas ordinarily succeed one another in our minds, we don't perceive it to move, and see it rather as a perfect unbroken circle of that matter or colour, and not a part of a circle in motion.

**9.** I conjecture (you decide for yourself) that while we are awake our ideas succeed one another in our minds at certain distances, somewhat like the images inside a lantern that are turned around by the heat of a candle. Their appearance in sequence may be sometimes faster and sometimes slower, but I guess that it doesn't vary much in a waking man. There seem to be limits to how quickly and to how slowly ideas can succeed one another in our minds.

**10.** My reason for this odd conjecture is my observation that in the impressions made on any of our senses we can perceive succession only within limits. If the sequence of impressions is exceedingly fast, the •sense of succession is lost, even in cases where it is obvious that there is a •real succession. Suppose that a cannon-bullet shoots across a room, on its way ripping off someone's leg: it couldn't be clearer that it must *successively* strike the two sides of the room, and that its damage to the victim must occur *between* those two events. And yet I don't think that anybody who felt the pain of such a shot and heard the blows against the two walls would perceive any succession in these events. A stretch of time like this, in which we perceive no succession, is what we call *an instant*. It is that which takes up the time of *only one idea in our minds*.

**11.** This also happens when the motion is very slow, not

providing the mind with a constant series of fresh sensory ideas as fast as the mind is capable of receiving them. In these cases, •other ideas *of our own thoughts* can insert themselves into our minds between •the ideas offered to our senses by the •slowly• moving body. So the sense of motion is lost. Although the body really does move, its •changes of perceivable distance from some other bodies is slower than the rate at which •ideas of our own minds—•ideas of reflection—naturally follow one another in sequence. The thing therefore seems to stand still; as is evident in the hands of clocks and shadows of sun-dials, and other constant but slow motions. . . .

**12.** It seems to me, then, that the constant and regular succession of ideas in a waking man is the measure and standard—so to speak—of all other successions. [The remainder of this section repeats the content of sections 10 and 11. Locke will take up temporal measurement in section 17 and run with it to the end of the chapter.]

**13.** Someone may say: ‘If the ideas of our minds constantly change and shift in a continual succession, it would be impossible for a man to think long about any one thing.’ If this means that a man can’t have one single idea for a long time alone in his mind, with no variation, I agree that it isn’t possible. The only reason I can give for this opinion is an appeal to experience; and I invite you to try whether you can keep one unvaried single idea in your mind, without any other, for a considerable period of time. •I can’t give a deeper and more explanatory reason for my view, because I lack the knowledge that this would require•. I don’t know how the ideas of our minds are made, or what they are made of, or what lights them up for us, or how they come to make their appearances.

[In sections **14–15** Locke predicts the difficulties that will confront anyone who accepts his ‘try it for yourself’ challenge. Section **16** repeats the thought of section 6, namely that the motions of bodies support our idea of succession only *through* the succession of ideas they cause in us.]

**17.** Once the mind has acquired the idea of duration, the next thing it is natural for it to do is to get some *measure* of this common duration, by which to judge its different lengths and think about the order in which various events occur. Without this, much of our knowledge would be confused, and much of history would be useless. When duration is considered as broken up into measured periods, the proper name for it is ‘time’.

**18.** To measure extension we need only to apply our standard or measure to the thing we are measuring—for example, laying a tape-measure along a length of cloth•. But in measuring duration we can’t do that, because no two parts of a sequence can be laid alongside one another. And nothing can measure duration except duration (just as nothing can measure extension except extension); but we can’t keep by us any standing unvarying measure of duration, as we can of certain lengths of extension, marked out in durable material things. All we are left with for a convenient measure of time is the dividing up of long periods into *apparently* equal portions, •these being measured• by constantly repeated kinds of event. Portions of duration that aren’t thought of as distinguished and measured by such periods aren’t strictly speaking instances of *time*, and we reflect this in phrases like ‘before all time’ and ‘when time shall be no more’.

[Sections **19–20** make and defend the following point: Although in our civilisation we measure time by movements, e.g. those of the earth around the sun, it is a mistake to think—as some philosophers have—that time and motion are

essentially tightly linked to one another. All the measuring of time requires is regular periodic events *of some kind*; they need not be movements. Locke gives examples of other standards for the measurement of time.]

**21.** ‘Without a regular motion such as the sun’s’, it may be demanded, ‘how could it ever be known that such periods were equal?’ I answer that the equality of any other periodic events could be known in the same way that days were known or presumed to be equal at first—namely, through judging them in terms of the contemporaneous series of ideas that had passed in men’s minds. [Locke develops this point in a long discussion of which the following episodes are especially notable.] We must carefully distinguish duration itself from the measures we make of it. Duration in itself is to be considered as going on in one constant, equal, uniform course; but none of our bases for measuring it can be known to do so. . . . If anyone should ask us how we know that the two successive swings of a pendulum are equal, it would be hard to satisfy him that they are infallibly so. . . . Since no two portions of a sequence can be brought together, it is impossible ever certainly to know their equality. All we can do for a measure of time is to take such ‘kinds of events’ as have continual successive appearances at *seemingly* equidistant periods. And of this seeming equality we have no measure except the sequence of our own ideas, with some confirmation from other probable reasons, to persuade us of their equality.

[In section **22** Locke criticises the view that ‘time should be *defined* to be the ‘measure of motion’, bringing against it the points made in sections 19–20, and adding one further point, namely that ‘time has no more right to the label ‘measure of motion’ than ‘space has.’]

[In section **23** Locke contends that there is no necessity about any of the measures of duration that we happen to use—minutes, hours, days, etc. We could adopt any others that satisfied the requirement of ‘regular periodical returns’.

**24.** Once the mind has acquired a measure of time such as the annual revolution of the sun, it can apply that measure to durations in which that measure didn’t exist. . . . The idea of duration equal to an annual revolution of the sun is as easily applicable in our thoughts to duration where no sun or motion was, as the idea of a foot or yard, taken from bodies here, can be applied in our thoughts to distances beyond the confines of the world, where are no bodies at all.

[Section **25** expands this point a little.]

**26.** If it is objected that in my account of time I have illegitimately assumed that the world is neither eternal nor ‘spatially’ infinite, I answer that my present purposes don’t require me to *argue* that the world is finite in duration and extension. That it *is* so is at least as conceivable as that it *isn’t*, so I am as entitled to assume the finiteness of the world as anyone is to suppose the contrary. ‘As regards conceivability’: I am sure that anyone who tries it will easily conceive in his mind the beginning of motion, and so may come to a stop—a go-no-further—in his consideration of motion; but he can’t in the same way conceive a beginning of all *duration*. So also in his thoughts he can set limits to body, but not to *space*. The utmost limits of ‘space and ‘duration are beyond the reach of thought, as are also the utmost limits of ‘number—and all for the same reason, as we shall see later.

**27.** The origin of our idea of time also gives us the idea of *eternity*. Here is how. Having acquired the idea of succession and duration in the manner I have described, and having

from the revolutions of the sun acquired the ideas of certain lengths of duration, we can in our thoughts add such lengths of duration to one another as often as we please, and apply the results of that addition to durations past or future. We can continue to do so without bounds or limits, proceeding ad infinitum. This lets us apply the length of the sun's annual motion to a duration before there was any sun or any motion; which is no more difficult or absurd than to apply my notion of one hour, based on the moving of a shadow on a sun-dial, to the duration of the burning of a candle last night, which is now absolutely separate from all actual motion. All this requires is the thought that if the sun *had* been shining on the dial at that time, its shadow *would have* moved from one hour-line to the next while the candle's flame lasted.

[In sections **28–9** Locke develops the idea that we can have the thought of determinate periods of time before there were any events by which to measure it. The crux is this, from **29**:] For measuring the duration of anything by *time*, the thing need not be co-existent with any motion that we use for temporal measurement, or indeed with *any* periodic revolution ·of a kind we *could* use for such measurement·. All we need is to have *the idea of* the length of some regular periodical appearances, an idea that we can in our minds apply to durations with which the motion or appearance never co-existed.

**30.** . . . I can imagine that light existed *three days* before the sun existed and moved, by having this thought:

The duration of light before the sun was created was of a length such that: if the sun *had* been moving then as it does now, it *would have* been equal to three of its daily revolutions.

. . . In this way I can have the thought of something's being the case a minute, an hour, a day, a year, or a thousand years before there were any moving bodies ·or any other regular periodic events·. For I need only to consider duration equal to one minute, and then I can add one minute more, ·and so on· until I come to sixty; and by the same way of adding minutes, hours, or years, . . . I can proceed ad infinitum. That involves supposing ·a duration that exceeds as many such periods as I can count, however long I go on; and I think that is the notion we have of ·eternity. The infiniteness of eternity involves the same idea as we have for the infiniteness of number, to which we can add for ever without end.

**31.** And thus I think it is plain that we get our ideas of duration, and our measures of it, from the two fountains of all knowledge that I have spoken of—reflection and sensation. [Then Locke swiftly recapitulates the six main topics of this chapter: idea of succession, idea of duration, measure of duration, thought of determinate lengths of duration when no measure exists, idea of eternity, idea of 'time in general'.]

## Chapter xv: Duration and expansion, considered together

1. Though I have dwelt pretty long on the topics of space and duration, I shall stay with them, comparing them with one another. They are important, and also in some ways abstruse and peculiar; and we may be helped to get a clear understanding of them by considering them together. I shall use the term '*expansion*' for the most general and abstract notion of space, because '*extension*' for some people involves some thought of extended bodies. . . . In both *expansion* and *duration* the mind has the common idea of continued lengths, capable of greater or less quantities; for we have as clear an idea of •how an hour differs from a day as we have of •how an inch differs from a foot.

2. The mind, having acquired the idea of the length of any part of expansion, can repeat it as often as it wants, moving out to the distance of the sun or of the remotest star. In moving out in this way the mind encounters nothing to stop its going on, inside the material world or beyond it. We can easily in our thoughts come to •the end of solid extension: •the outer edge of all body we can easily arrive at •in our thought. But when the mind is there, it finds nothing to hinder it from moving on into the endless expansion beyond; of *that* it can't even conceive any end. Don't say 'Beyond the bounds of body there is *nothing at all*', unless you are willing to confine God within the limits of matter. . . .

3. Similarly with duration: having acquired the idea of some length of duration, the mind can double, multiply, and enlarge it—beyond the existence of all bodies and all the measures of time taken from the great bodies of the world and their motions. Yet everyone readily admits that although we rightly make duration boundless we cannot extend it

beyond all being. We all agree that God fills eternity; and (•returning for a moment to the last topic of section 2•) it is hard to find a reason for anyone to doubt that God likewise fills immensity. His infinite being is certainly as boundless in one way as in the other; and to say that *where there is no body there is nothing at all* is, I think, to give too much importance to matter.

[In section 4 Locke says that many people who are sure that time is infinite hesitate to say the same about space, and he suggests a reason. It is because we think of both time and space—or, more strictly, duration and expansion—as states or properties of some being, some *thing*; where duration is concerned, the thing can be God; but we don't think of God as extended, and so where space is concerned we are apt to think that it stops where matter stops because beyond the edge of the material world there is no *thing* for space to be an attribute of. Here Locke interpolates some thoughts about a likeness between the Latin roots of the words for 'enduring' and for 'hard'. Then, returning to his main thought in this section:] But be that as it may, it is certain that anyone who pursues his own thoughts will find that they sometimes launch out beyond the extent of body into the infinity of space or expansion, the idea of which is distinct and separate from body and all other things.

5. *Time* in general is to *duration*, as *place* is to *expansion*. Time and place are such portions of those boundless oceans of eternity and immensity as have been set out and distinguished from the rest, as it were by land-marks. [The remainder of this section elaborates that a little.]

**6.** ‘Time’ and ‘place’, taken thus ‘to stand’ for determinate distinguishable portions of those infinite abysses of space and duration that are supposed to be marked off from the rest by known boundaries, have each of them a double meaning.

First, *time* in general is commonly taken for that part of infinite duration that is measured by, and co-existent with, the motions of the great bodies of the universe. In that sense time begins and ends when this sensible world begins and ends—see iv.18. *Place* is also sometimes taken for that portion of infinite space that is occupied by the material world, and is thereby distinguished from the rest of expansion (though this is better called ‘extension’ than ‘place’). . . .

**7.** Secondly, sometimes ‘time’ is used in a broader sense, and is applied not only to parts of that infinite duration that were really distinguished and measured out by periodical motions of bodies that we use as our measures of time, but also to other portions of it that we suppose to be equal to certain lengths of measured time—thus considering them as bounded and determined ‘even if they were really not so’. In this spirit we might say ‘Angels were created 7640 years before the world was’, thereby marking out as much of that undifferentiated duration as we suppose would have allowed 7640 annual revolutions of the sun if it moved at its actual rate. Likewise we sometimes speak of *place*, *distance*, or *volume* in the great emptiness beyond the edge of the world, when we pick out in thought an amount of it that could contain a body of any assigned dimensions, such as a cubic foot; or suppose a point in it at such-and-such a distance from a given part of the ‘material’ universe.

**8.** *Where?* and *When?* are questions that can be asked about any finite existent, and we always answer them in

terms (‘for *Where?*’) of relations to some known parts of ‘this perceptible world and (‘for *When?*’) of relations to certain periods marked out to us by the motions observable in ‘it. Without some such fixed parts or periods, our finite minds would be lost in the boundless invariable oceans of duration and expansion. [Locke then adds details to this comparison between expansion and duration, space and time.]

**9.** Space and duration are greatly alike in another way, namely that although they are rightly counted as ‘simple ideas, every distinct idea we have of either of them involves some ‘composition’ ‘because’ it is the very nature of each to consist of parts. Still, they are entitled to count as simple ideas, because their parts are all of the same kind, involving no mixture of any other idea. If the mind could (as with number) reach the thought of a part of extension or duration that is too small to be divided, that would be the indivisible unit or idea by repetition of which the mind would make its more enlarged ideas of extension and duration. But since the mind can’t form an idea of any space without parts, it instead makes use of common measures such as inches and feet, and repeats *them* to get ideas of larger extents. ‘And similarly with time’. [Locke continues with remarks about the ‘obscure and confused’ ideas that we have of very large or very small amounts of space or time. (The idea of *ten million cubic miles* isn’t clear, though its *ten million* component is so.) He observes that we have a rough and ready idea of a minimum amount of time or of space—namely the smallest amount of which we can form a clear and distinct idea.]

[In section **10** Locke likens expansion to duration in this: both have parts, but it makes no sense to think of either of them as being taken apart.]

**11.** Here is a manifest difference between expansion and duration. The ideas of ‘length that we have can be turned

in every direction, and so make shape, and breadth, and thickness; whereas •duration is like the length of one straight line, extended ad infinitum, and not capable of multiplicity, variation, or shape. Duration is something of which all things, while they exist, equally partake. For *this present moment* is common to all things that are now in being, and contains that •present• part of their existence, . . . and we may truly say that they all exist in the same moment of time.

Whether angels and Spirits have any analogy to this in respect to expansion is beyond my comprehension. Our understandings and comprehensions are suited to our own survival and the purposes of our own lives, but not to the reality and extent of all other things. So it is nearly as hard for us to conceive of any real being with a perfect negation of every kind of expansion as it is to have the idea of a real being with a perfect negation of every kind of duration. So we don't know •and can't even think about• what •Spirits have to do with space, or how they relate to one another in it. All that we know is that each •body possesses its own portion of it, according to the extent of its solid parts, excluding all other bodies from that portion of space for as long as it is there.

**12.** Duration—and time, which is a part of it—is the idea we have of *perishing distance*, of which no two parts exist together, but follow each other in sequence; and expansion is the idea of *lasting distance*, all of whose parts exist together, and are not capable of succession. [By 'perishing distance' Locke

seems to mean the ever-shrinking temporal distance between the present time and some future event.] •Because our idea of duration is as it is•, we can't get our minds around the thought of a being that •now exists tomorrow, or that •now has more than the present moment of duration. Yet we can conceive God's eternal duration as being far different from ours and any other finite being's. Our knowledge and power don't range over all past and future things; our thoughts are only of yesterday, and we don't know what tomorrow will bring. We can never bring anything back once it is past; and we can't make present what is yet to come. What I say here about *us* I say of *all finite beings*. Even ones that far exceed man in knowledge and power are still no more than the meanest creature in comparison with God. Something finite, however great and grand it is, stands in no proportion to what is infinite. Because God's infinite duration is accompanied by infinite knowledge and infinite power, he sees all things past and to come; and they are no more distant from his knowledge than the present. And there is nothing that he can't make exist whenever he likes. For the existence of all things depends on his good pleasure, so all things exist at every moment that he thinks fit to have them exist.

A final remark: expansion and duration *contain* each other: every part of space is in every part of duration, and every part of duration is in every part of expansion. In all the great variety of our thoughts, this combination of two distinct ideas seems to have almost no equal. It may be worth thinking about further.

## Chapter xvi: Number

1. Among all the ideas that we have, none is •suggested to the mind by more ways, and none is •more simple, than the idea of *unity* or *one*. It •hasn't a trace of variety or composition in it; and •every object that our senses are brought to bear on, every idea in our understandings, every thought of our minds, brings this idea along with it. This makes it the most intimate to our thoughts, and also the most universally applicable idea that we have. For *number* applies itself to men, angels, actions, thoughts, everything that exists or can be imagined.

2. By repeating this idea in our minds, and adding the repetitions together, we come by the complex ideas of its modes. [Here and in many later passages, 'mode' means what 'modification' meant earlier, e.g. in xiii.1, namely 'special case', so that *two* is a mode of *number*.] Thus by adding one to one we have the complex idea of a couple; by putting twelve units together we have the complex idea of a dozen; and so on for any other number.

3. The simple modes of number are the most distinct of all our ideas. Every least variation—namely, of *one unit*—makes each combination as clearly different from its nearest neighbour as it is from the most remote: *two* is as distinct from *one* as from *two hundred*. . . . This is not so with other simple modes, where it can be hard and perhaps impossible for us to distinguish between two nearby ideas even though they are really different. Who will undertake to find a difference between the white of this paper and that of the next degree of whiteness to it? Who can form distinct ideas of every difference in size, however small?

4. Demonstrations with numbers may not be more evident and exact than demonstrations with extension, but they are more •general in their use and more •determinate in their

application. Or so I am inclined think, because each mode of number is so clearly distinct from all others, even close ones, whereas with extension not every equality and excess is so easy to observe or measure. With number we have the idea of a *unit*, but with extension our thoughts can't arrive at any determined smallness beyond which it can't go, comparable with a unit. . . . No-one can specify an angle that is the *next biggest* to a right angle!

5. By repeating the idea of a unit, joining it to another unit, we make one collective idea marked by the name 'two'. If someone can do this, and can carry the procedure further by adding *one* to each collective idea that he reaches, and also gives a name to every number whose idea he comes to, then he can *count*. . . . He can add one to one, and so to two, and so go on with his tally, taking with him the distinct names belonging to every stage in the progression; and so he is capable of all the ideas of numbers for which he has names. Perhaps not of ideas for which he doesn't have names; because the various simple modes of numbers have no variety, and can't differ from one another in any way except as *more* or *less*, so that names or marks for each separate combination seem more necessary than with any other sort of ideas. For without such names or marks we can seldom make use of numbers in calculating, especially in cases involving a great multitude of units. When such a multitude is assembled in thought without a name or mark to distinguish that precise collection, it will hardly be kept from collapsing into a confused heap.

6. I think this is why some Americans [= 'American Indians'] with whom I have spoken, though otherwise quick and intelligent, didn't have our ability to count to 1000, and had no distinct idea of that number, though they could calculate very well up to 20. Their language was scanty, being accommodated only

to the few necessities of survival in a simple way of life that didn't involve either trade or mathematics; so it contained no word to stand for 1000. When I spoke to them about those greater numbers, they would show the hairs of their head, to express a great multitude that they couldn't number. [After giving another example, Locke speaks of the possibility of our wanting to think about higher numbers than we usually do, and thus needing names for them. He proposes that as well as 'million' we adopt 'billion', 'trillion', 'quadrillion' and so on, up to 'nonillion'—and further if we need to. His billion is a million millions.]

[In section 7 Locke discusses children, who, at a time when they have a great deal of intellectual capacity, can't count or handle particular numbers in other ways; and some adults who 'through the default of their memories' have a life-long inability to cope with higher numbers. He concludes:] To calculate correctly, one must do two things: **1** distinguish carefully two ideas that differ from one another only by one unit; **2** retain in memory the names or marks of the several combinations, from a unit up to that number—not confusedly and at random, but in the exact order in which the numbers follow one another. If one goes wrong in *either* of

these, the whole business of numbering will be disturbed, the ideas necessary for distinct numeration won't be achieved, and one will be left only with the confused idea of *multitude*.

**8.** Number is what the mind makes use of in measuring things. The main things that are measurable are expansion and duration; and our idea of infinity, even when applied to those—in the ideas of •infinite expansion and •infinite duration—seems to be nothing but the infinity of *number*. What else are our ideas of •eternity and •immensity but the repeated additions of certain ideas of imagined parts of duration and expansion, with ·help from· the infinity of number, in which we can come to no end of addition? ·Regarding that last point·: Let a man collect into one sum as great a number as he pleases, its size doesn't lessen even slightly his power of adding to it, or bring him any nearer the end of the inexhaustible stock of number, where there still remains as much to be added as if none were taken out. This addition—or *addibility*, if you wish—of numbers which is so apparent to the mind is, I think, what gives us our clearest and most distinct idea of infinity. More about that in the next chapter.

## Chapter xvii: Infinity

1. If you want to know what kind of idea it is that we name 'infinity', you can't do better than to consider what the idea of infinity is most immediately applied to by the mind, and then how the mind comes to form this idea.

*Finite* and *infinite* seem to me to be viewed by the mind as modes of *quantity*, and to be attributed primarily and initially only to things that have parts, and can be augmented or diminished by the addition or subtraction of parts, however small. Such are the ideas of *space*, *duration*, and *number*, which we have considered in xiii-xvi. No doubt we must accept that the great God is incomprehensibly infinite; but when we apply 'infinite' to that first and supreme being, we do it primarily in respect to *when* and *where* he exists, in the judgment that he exists always and everywhere; and we apply infinity more figuratively (I think) to his power, wisdom, and goodness, and other attributes, which are in their own natures inexhaustible and incomprehensible, etc. When we call them 'infinite' we have no other idea of this infinity except what carries with it some reflection on, and imitation of, that *number* or *extent* of the acts or objects of God's power, wisdom, and goodness. I make no claim about how these attributes are in God, who is infinitely beyond the reach of our narrow capacities. They certainly contain in them all possible perfection. But this, I say, is how we conceive them, and these are our ideas of their infinity.

2. *Finite* and *infinite*, then, are viewed by the mind as modifications of expansion and duration. Next we must consider how the mind comes by these ideas. There is no great difficulty about *finite*. The obvious portions of extension that affect our senses carry the idea of *finite* with them into the mind; and the ordinary periods (hours,

days, years) whereby we measure time and duration are bounded lengths, and thus *finite*. What is difficult is to grasp how we come by those boundless ideas of eternity and immensity, since the objects we interact with fall so far short—immeasurably short—of that largeness.

3. Someone who has an idea of some stated length of space finds that he can repeat it, going from the idea of one foot (say) to that of two feet, and that by further addition he can go to three feet, and so on without ever reaching an end of his addition. This holds good whether he started with the idea of a foot, or of a mile, or of the diameter of the earth. Whatever he starts with, and however often he multiplies it, he finds that however far he has gone he has no more reason to stop—and isn't one jot nearer the end—than he was when he set out. From this he takes the idea of infinite space.

4. That account of the source of the idea of infinite space doesn't settle whether there actually exists a boundless space answering to the idea, because our ideas aren't always proofs of the existence of things. Still, since the question of space's infinity has come up here, I remark that we are apt to think that space is actually boundless; the idea of space or expansion naturally draws us in that direction. Whether we consider it as the extension of body or as existing by itself without any solid matter occupying it, the mind can't possibly find or suppose any end of it, or be stopped anywhere in its progress in this space. Any boundary to the world of bodies—even one with diamond-hard walls—is so far from *stopping* the mind's further progress in space and extension that it actually *helps it to continue*. When we reach the utmost extremity of body, what do we find that can put a

stop, and satisfy the mind that it *is* at the end of space when it perceives that it *is not*—when, indeed, it is satisfied that body itself can move into it [= into the space outside the present material boundary]? Here is why. A body can move through empty space within the world of bodies; indeed it can't move anywhere *except* into empty space (·see xiii.22·). It is clear and evident that if a body can move into an empty space interspersed amongst bodies, it must be equally possible for it to move into empty space beyond the outer boundaries of the world of bodies. That is because idea of empty pure space is exactly the same *within* as *beyond* the limits of all bodies, and there is nothing to hinder body from moving into it in either case. Thus, wherever the mind places itself by any thought, either in among bodies or far away from them, it can't find any *end* anywhere in this uniform idea of space; and so it has to conclude, by the very nature and idea of each part of space, that space is actually infinite.

[Section 5 gives a similar account of how we 'come by the idea of eternity' or infinite duration. The question of whether any real thing lasts for ever, Locke says, isn't answered merely by our having an idea of eternity. He holds that if something exists now, then something has existed for eternity, but he will discuss this 'in another place' (IV.x.2–3). and won't discuss it here.]

**6.** If we get our idea of infinity from our ability to repeat our own ideas without end, you may wonder why we don't attribute infinity to ideas other than those of space and duration. Other ideas can be as easily and as often repeated in our minds as can those of space and duration; but nobody ever thinks of infinite sweetness, or infinite whiteness, although we can repeat the idea of sweet or white as frequently as those of a yard or a day. Here is my answer. All the ideas that are considered as having parts, and can be

increased by adding equal or lesser parts, give us through their repetition the idea of infinity; because this endless repetition generates a continued enlargement that cannot come to an end. But with other ideas it is not so. [Locke defends this by canvassing the possibilities for what goes on when one tries to add one idea of whiteness to another. The reason why they don't allow of endless additions, he says, is that the idea of whiteness involves *degrees* but not *parts*. He concludes:] Those ideas that don't consist of parts can't be augmented to whatever proportion men please, or be stretched beyond what men have received by their senses; but space, duration, and number, being capable of increase by repetition, leave in the mind an idea of endless room for more. The latter ideas alone lead our minds towards the thought of infinity.

**7.** Although our idea of infinity arises from thoughts about quantity, when we join infinity to any supposed idea of quantity, and so think about an *infinite quantity*—an infinite space, or an infinite duration—we fall into great confusion. That is because our idea of infinity is an *endlessly growing* idea, while any idea the mind has of a quantity *terminates* in that very idea (which can't be greater than itself); so when we try to combine them in the thought of an infinite quantity we have to adjust a standing measure to a growing volume. So I think there is serious reason to distinguish the idea of •*the infinity of space* from the idea of •*a space that is infinite*. The former is nothing but •a supposed endless progression of the mind over whatever repeated ideas of space it pleases; but to have actually in the mind the idea of •a space that is infinite is to suppose that the mind has already passed over and actually viewed all those repeated ideas of space. Even an endless repetition can never go through them all; so to suppose that one has done so is a plain contradiction.

**8.** This may become clearer if we apply it to numbers. [Locke then presents a line of thought like that of section 7, leading to the conclusion that we have a clear and legitimate idea of the infinity of number(s) but that it is absurd to think that we can have an ‘actual idea of an infinite number’. He applies this also to ‘infinite duration’, and repeats it for ‘infinite space’. A typical episode is this:] However large an idea of space I have in my mind, it is no larger than it is at this instant when I have it, though I am capable of doubling it an instant later, and so on ad infinitum.

[In sections **9–11** Locke argues—amplifying a hint he gave in xvi.8—that when we think about the infinity of space or of duration, what we are engaged with is ‘the infinity of number applied to determinate parts of which we have distinct ideas’. Our thought of eternity is that of a duration that is *infinitely many* years long; our thought of ‘immensity’ is that of a region whose volume is *infinitely many* cubic yards.]

**12.** In any mass of matter our thoughts can never arrive at the ultimate division, so there is an apparent infinity to us in that also. It too involves the infinity of number, but with the difference that it is like division rather than addition. Still, it does involve proceeding ad infinitum, with new numbers—smaller and smaller fractions—all the way. A similarity: just as we can’t by addition reach the idea of an infinitely great space, so by division we are unable to reach the idea of an infinitely small body; because our idea of infinity is (so to speak) a growing or fugitive idea, always in a boundless progression, stopping nowhere.

**13.** Although hardly anyone is so absurd as to claim to have the positive idea of an actual infinite number, . . . there are people who imagine they have positive ideas of infinite duration and space. I think it would be enough to destroy any such ‘purported’ positive idea of something infinite to

ask its owner whether he could add to it; that would easily show his mistake. . . . An infinite idea of space or duration must be made up of infinite parts; so ‘the thought of’ its infinity must consist in ‘the thought of’ its having parts •whose number can always be further added to; it doesn’t involve •an actual positive idea of an infinite number. It is evident that by adding together finite things (and all the lengths of which we have positive ideas *are* finite) we can never produce the idea of infinite in any way except the way we do with number. . . .—adding more and more units of the same kind, without coming one jot nearer to the end of the process.

**14.** Those who want to prove that their idea of infinite is positive seem to do it through a ridiculous argument: the idea of an *end* is negative, so the idea of infinity—the *negation of an end*—is positive! Someone who sees that where bodies are concerned an end is just the extremity or surface of the body will not readily grant that the end is a bare negative, any more than will someone who sees that the *end* of his pen is black or white! Where duration is concerned, an end isn’t •the bare negation of existence but rather •the last moment of it. Also, the people I am arguing against here can’t deny that the *beginning* is the first instant of being, and isn’t conceived by anyone to be a bare negation; so by their own argument they should admit that the idea of an eternal past, or of a duration *without* a beginning, is a negative one.

[In section **15** Locke develops these views further. He agrees that when we think of (say) the infinity of space our thought does include a positive element, namely the vague thought of a really enormously large stretch of space; but he distinguishes that from a genuine thought about infinity. His crucial triple-point in this section is the following.] **1** The

idea of *so much* is positive and clear. **2** The idea of *greater* is also clear, but it is only a comparative idea. **3** The idea of *so much greater that it cannot be comprehended* is a plain negative, not a positive. [A little later:] What lies beyond our positive idea towards infinity lies in obscurity, and has the indeterminate confusion of

a negative idea in which I know that I can't include all that I want to, because that is too large for a finite and narrow ·mental· capacity ·such as mine·;

and that—where the greatest part of what I want to include is left out, and merely given the vague label 'still greater'—must be very far from a positive complete idea. . . .

[In section **16** Locke challenges those who think they have a positive idea of eternity. If there is or could be an eternally existing thing, he demands, has it lasted longer today than it had yesterday? The answer Yes strikes him as absurd because it involves different eternities, with different lengths. But the only way to support the answer No is to equate eternal duration with a kind of eternal *present*, to which the idea of succession, of longer and shorter durations, doesn't apply. He aligns himself with those who find this unintelligible.]

[Section **17** repeats section **14**'s point that there is nothing negative about the concept of a *beginning*.]

**18.** We can no more have a positive idea of the largest space than we can of the smallest space. The latter seems the easier of the two, and more within our intellectual reach, but really all we can manage is a comparative idea of smallness—the idea of a smallness that *will always be less than any of which we have a positive idea*. All our •positive ideas of any quantity, whether big or small, have bounds; though there are no bounds to the •comparative idea through which we can always add to the big or take from the small. [Locke

has mostly been using 'positive' as the opposite of 'negative'; but here and in some other places he uses it as the opposite of 'relational' or 'comparative'.] But the part (big or small) that isn't covered by our positive idea lies in obscurity; and we have no idea of it except the idea of the power of endlessly enlarging one and diminishing the other. The acutest thought of a mathematician can no more isolate ·the idea of· an indivisible ultimate particle of matter than a chemist wielding a pestle and mortar can ·physically· isolate such a particle. And a philosopher by the quickest flight of mind can no more reach ·a thought of· infinite space, containing it within a positive idea, than a surveyor can mark it out with his chain measure. When you think of a cube with a one-inch side, you have a clear and positive idea of it in your mind, and so can form one of  $\frac{1}{2}$ ,  $\frac{1}{4}$ , and so on, until you have the idea something very small. But it still isn't the idea of that incomprehensible smallness that division *can* produce. What remains of smallness [Locke's phrase] is as far from your thoughts as it was when you first began; so you never come to have a clear and positive idea of that smallness that is implied by infinite divisibility.

[Section **19** repeats the main point in a mildly joking manner.]

**20.** I have encountered people who agree that they cannot have a positive idea of •infinite space, but are sure they have one of •eternity. Here is my explanation for their mistaken view that the two should be treated differently. By thinking about causes and effects, they are led to think that we must admit some *eternal being*, and so to consider the reality of that being as matched by their idea of eternity; but on the other hand they have no argument driving them to admit the existence of some *infinite body*, which indeed they find absurd; and so they rush into •concluding that they can

have no idea of infinite space because they can have no idea of infinite matter. [The argument about causes and effects and an eternal being is approvingly presented in IV.x.2–3.] This •inference is a poor affair, because the existence of matter isn't necessary to the existence of space any more than the existence of motion or of the sun is necessary to duration, although duration is commonly measured by motion of the sun. A man can have the idea of ten thousand miles square without any body as big as that, as well as the idea of ten thousand years without any body as old as that. . . . Why should we think our idea of infinite space requires the real existence of matter to support it, when we find that we have as clear an idea of an •infinite duration to come as we have of •infinite duration past? [In the remainder of this section Locke expands these points somewhat, concluding thus:] If a man had a positive idea of infinity, whether of duration or of space, he could add two infinities together, making one infinite infinitely bigger than another—an absurdity too gross to be worth arguing against.

**21.** If after all this you still think you *do* have clear positive comprehensive ideas of infinity, enjoy your privilege! Some of us who *don't* would like to hear from you about it. Until now I have been apt to think that the great and inextricable difficulties that perpetually arise in all discussions about infinity, whether of space, duration, or divisibility, have been

sure signs of a defect in our ideas of infinity—namely the disproportion between •infinity itself and •how much our narrow minds can take in. Men talk and dispute about infinite space or duration, as if they had complete and positive ideas of them; . . . but the incomprehensible nature of the thing they are talking or thinking about leads them into perplexities and contradictions; and their minds are swamped by an object too large and mighty to be surveyed and managed by them.

**22.** If I have lingered rather long on duration, space, and number, and on what arises from thinking about them, namely infinity, it may be no more than the topic requires, for there are few simple ideas whose modes give more exercise to the thoughts of men than those do. I don't claim to have treated them in their full extent; all I need is to show how the mind receives those ideas, such as they are, from •sensation and •reflection, and how even our idea of infinity—remote as it seems to be from any •object of sense or •operation of our mind—originates in sensation and reflection as do all our other ideas. Perhaps some very advanced mathematicians have other ways to introduce ideas of infinity into their minds; but this doesn't alter the fact that even they, like all other men, first acquired their ideas of infinity from sensation and reflection in the manner I have described.

## Chapter xviii: Other simple modes

1. Perhaps I have given enough examples of *simple modes* of the *simple ideas of sensation*, going so far as to show how from simple ideas taken in by sensation the mind comes to extend itself even to infinity. . . . Still, for method's sake I shall briefly describe a few more 'simple modes' before moving on to ideas that are more complex. 'Remember that in my classificatory system *simple modes* are *complex ideas*, though they are *less complex* than *complex modes* are.'

2. To 'slide', 'roll', 'tumble', 'walk', 'creep', 'run', 'dance', 'leap', 'skip', and many others that might be named, are words for which every English-speaker has in his mind distinct ideas, which are all modifications of *motion*. Modes of motion correspond to those of extension: *swift* and *slow* are two different ideas of motion, measured by distances of time and space put together; so they are complex ideas comprehending time and space with motion.

3. We have a similar variety with *sounds*. Every articulate word is a different modification of sound; and from hearing such modifications the mind can be provided with almost infinitely many distinct ideas. [Locke also mentions the sounds of birds and beasts, and the auditory ideas that a composer may have in his mind when silently composing a tune.]

4. Ideas of colours are also very various. We pick out some of them as the different degrees or 'shades' (as they are called) of the same colour. But since we very seldom put different *colours* together for use or for pleasure without also giving a role to *shape*—as in painting, weaving, needle-work, etc.—the colours that we pick out for attention usually belong to mixed modes, as being made up of ideas of two kinds,

shape and colour, as for example *beauty*, *rainbow*, etc.

5. All compounded tastes and smells are also modes made up of the simple ideas of those senses. But because we seldom have names for them, we take less notice of them, and they can't be explained in writing. you'll have to think up your own examples from your own experience.

6. Here is a point about simple modes that are considered to be merely different degrees of the same simple idea, 'e.g. slightly different shades of green'. Though many of them are in themselves entirely distinct ideas, when the difference between them is very small they ordinarily don't have separate names, and the differences are not much taken notice of. I leave it to you to think about whether this is 'because men haven't had ways of precisely distinguishing amongst them, or rather 'because distinguishing them wouldn't yield knowledge that would be of general or necessary use. . . . Once the mind has acquired some simple ideas, it can variously repeat and compound them, and so make new complex ideas. 'This actually happens with some of our simple ideas and not with others'. Though *white*, *red*, *sweet*, etc. haven't been modified or made into complex ideas by various combinations so as to be named and thereby sorted into kinds, some other simple ideas, namely those of *unity*, *duration*, *motion*, etc. (already discussed) and also *power* and *thinking* ('to be discussed in xxi and xix respectively'), have been modified into a great variety of complex ideas with names belonging to them.

[In section 7 Locke offers to explain this. The primary concerns of people have been with *one another*; they have mainly needed efficient ways of thinking and talking about

their own behaviour—including the actions performed in specialized trades, for which technical terms are coined that the rest of the populace wouldn't understand. Ideas such

as those of tastes and smells haven't had a great role in this kind of thought and speech, which is why we have few names for them. Locke undertakes to return to this in III.]

## Chapter xix: The modes of thinking

1. When the mind looks in on itself and attends to its own actions, *thinking* is the first action it encounters. The mind observes a great variety of kinds of thinking, receiving different ideas from each. For example, the perception that accompanies and is attached to any impression made on the body by an external object gives the mind a distinct idea that we call *sensation*, which is, as it were, the actual entrance of any idea into the understanding by way of the senses. The same idea, when it occurs without the operation of any such object on the organs of sense, is *remembrance*; if it is sought by the mind and eventually, with considerable effort and difficulty, brought back into view, it is *recollection*. [The section continues with some others: contemplation, 'that which the French call *rêverie*', attention, 'intention, or study', dreaming, ecstasy. Here and in section 4 Locke uses 'intention' in its old sense of 'intentness' or 'strenuous mental focus'.]

2. These are a few examples of the various modes of thinking that the mind can observe in itself, and so have distinct ideas of. I don't claim to enumerate them all, or to give an extensive treatment of this set of ideas that are acquired from reflection, for that would fill a book. However, I shall later treat at some length *reasoning*, *judging*, *volition*, and *knowledge*, which

are some of the most considerable operations of the mind and ways of thinking.

[Section 3 adds some detail about differences amongst attention, *rêverie*, and dreaming. It ends with this:] Sometimes the mind fixes itself so earnestly on thinking about some objects. . . .that it shuts out all other thoughts, and takes no notice of the ordinary impressions that are then being made on the senses. . . . At other times it hardly notices the sequence of ideas that succeed in the understanding, and doesn't pursue any of them. And at other times it lets them pass almost entirely unregarded, as faint shadows that make no impression.

4. I think everyone must have experienced within himself this difference in degree of •intention (and of its opposite, •remission) on a scale running from •*earnest study* at one end to •*very nearly minding nothing at all* at the other. Go down the scale a little further still and you find the mind in sleep—withdrawn from the senses, and out of the reach of motions made on the sense-organs that at other times produce very vivid and perceptible ideas. . . . In this state of withdrawal from the senses, the mind often retains a looser and less coherent manner of thinking that we call *dreaming*. Finally, sound sleep lowers the curtain in front

of the stage, putting an end to all appearances. . . . A side remark, ·returning briefly to the main topic of i.10–22·: We all have experience of our minds' thinking with various degrees of intensity; even a waking man may have thoughts that are so dim and obscure as to be close to having none at all; so

isn't it probable that thinking is something the soul *does* but is not its *essence*? A thing's •operations can easily be performed more or less intensely, but we don't think of the •essences of things as capable of any such variation.

## Chapter xx: Modes of pleasure and pain

**1.** Among the simple ideas that we receive from both sensation and reflection, *pain* and *pleasure* are two very considerable ones. •Bodily sensations may occur alone or accompanied by pain or pleasure; and •the thoughts or perceptions of the mind may also occur solo or else accompanied by pleasure or pain, delight or trouble, call it what you will. Like other simple ideas, these two can't be described, nor can their names be defined; the only way to know them is by experience. A 'definition' of them in terms of the presence of good or evil makes them known to us only by making us reflect on *what we feel in ourselves* when we think about or undergo various operations of good and evil.

**2.** Things, then, are good or bad only in reference to pleasure or pain. [Locke wrote 'good or evil', but in his usage 'evil' means merely 'bad', without the extra force the word has today. When used as a noun, as in 'presence of evil', it is left unchanged because 'bad' doesn't work well as a noun.] ·So that the attempt to define 'pleasure' and 'pain' in terms of good and evil puts things back to front·. We call something 'good' if it is apt to cause or increase pleasure or diminish pain in us, or else to enable us to get or retain some other good. On the other side, we call something 'bad'

if it is apt to produce or increase pain or diminish pleasure in us or. . . [etc.] I am speaking of pleasure and pain of body or of mind, as they are commonly distinguished, though really they are all states of the mind—sometimes caused by disorder in the body and sometimes by thoughts of the mind.

**3.** Pleasure and pain and that which causes them, good and evil, are the hinges on which our passions turn. If we reflect on ourselves, and observe how these operate in us in various contexts, what states of mind and internal sensations (if I may so call them) they produce in us, this may lead us to form the ideas of our *passions*.

**4.** Anyone reflecting on the thought he has of the delight that any present or absent thing is apt to produce in him has the idea we call *love*. [Locke gives the example of someone who—in season and out—loves grapes.]

**5.** On the other side, the thought of the pain that anything present or absent is apt to produce in us is what we call *hatred*. If my theme were not confined to the bare *ideas* of our passions in their dependence on different kinds of pleasure and pain, I would remark that our love and hatred of •inanimate or unfeeling things is commonly founded on the

pleasure and pain we get from using them and encountering them through our senses, even if such use destroys them. But hatred or love towards beings who are capable of happiness or misery is often the uneasiness or delight that we get just from the thought that they exist, or from the thought of their being happy. . . . But it suffices to note that our ideas of love and hatred are merely ideas of the dispositions of the mind to experience pleasure or pain, however caused in us.

**6.** A man's uneasiness over the absence of something whose present enjoyment carries the idea of delight with it is what we call *desire*; which is greater or less according to whether the uneasiness is more or less intense. [Locke adds some remarks about uneasiness as 'the chief if not only spur to human industry and action'. He admits that this is off his intended path; he'll deal with it at length in xxi.29–40.]

**7.** *Joy* is a delight of the mind from the thought of a good that one now possesses or will certainly possess in the future. We are possessed of a good when we have it in our power so that we can use it when we please. Thus a nearly starving man has joy at the arrival of food, even before he has the pleasure of eating it. . . .

**8.** *Sorrow* is uneasiness in the mind upon the thought of a lost good that might have been enjoyed longer; or the sense of a present evil.

**9.** *Hope* is that pleasure in the mind that everyone finds in himself when he thinks about a probable future enjoyment of something that is apt to delight him.

**10.** *Fear* is an uneasiness of the mind from the thought of future evil that is likely to come to us.

**11.** *Despair* is the thought that some good is unattainable. This works variously in men's minds, sometimes producing uneasiness or pain, sometimes slack passivity.

**12.** *Anger* is uneasiness or discomposure of the mind when one is harmed and intends to get revenge for this.

**13.** *Envy* is an uneasiness of the mind caused by the thought of a good that we desire that has been obtained by someone we think should not have had it before us.

**14.** These two last, envy and anger, are not caused simply by pain and pleasure, but have other ingredients in them—thoughts regarding oneself or others—which is why they aren't to be found in all men, because some men don't have those thoughts of their own merits (envy) or of intending revenge (anger). All the rest, which come down to purely pain and pleasure, are I think to be found in all men. For basically we love, desire, rejoice, and hope only in respect of pleasure, and hate, fear, and grieve only in respect of pain. In short, all these passions are moved by things only when they appear to be causes of pleasure and pain, or to be in some way associated with pleasure or pain. Thus we extend our hatred usually to the subject (at least if it is an agent that has perceptions and purposes) which has given us pain, because the fear it leaves with us is a constant pain. But we don't so constantly love what has done us good, because pleasure doesn't operate on us as strongly as pain does, and because we aren't as apt to hope that a good-doer will bring pleasure again as we are to fear that a bad-doer will bring pain again. But this is by the way.

[In section **15** Locke repeats that he means 'pleasure' and 'pain', 'delight' and 'uneasiness', to cover mental as well as bodily ups and downs.]

**16.** It should further be noted that so far as the passions are concerned, the removal or lessening of a pain is considered as a pleasure and operates as such; and the loss or diminishing of a pleasure, as a pain.

**17.** Most of the passions in most persons operate on the body, causing various changes in it; but as these aren't always perceptible, and indeed in some cases don't occur at all, they don't make a necessary part of the idea of each passion. For example, *shame*, which is an uneasiness of the mind on the thought of having done something that is indecent or will lessen others' valued esteem for us, isn't always accompanied by blushing.

**18.** Don't take me to be offering a treatise on the passions. There are many more of them than I have named; and each of those I have attended to merits a much fuller and more detailed treatment. I have mentioned these only as so

many instances of *modes of pleasure and pain* resulting in our minds from various considerations of good and evil. I might perhaps have given instances that are simpler than these and don't count as passions, such as the pains of hunger and thirst and the pleasure of eating and drinking to remove them; the pain of sore eyes, and the pleasure of music; the pain of quarrelsome unproductive argument, and the pleasure of reasonable conversation with a friend. But the passions are more important to us than the simpler pleasures and pains, which is why I chose to focus on them and to show how our ideas of them come from sensation or reflection.