

Chapter ii: No innate ·speculative· principles in the mind

1. Some people regard it as settled that there are in the understanding certain innate principles. These are conceived as primary notions [= ‘first thoughts’]—letters printed on the mind of man, so to speak—which the soul [= ‘mind’; no religious implications] receives when it first comes into existence, and that it brings into the world with it. I could show any fair-minded reader that this is wrong if I could show (as I hope to do in the present work) how men can get all the knowledge they have, and can arrive at certainty about some things, purely by using their natural faculties [= ‘capacities’, ‘abilities’], without help from any innate notions or principles. Everyone will agree, presumably, that it would be absurd to suppose that the *ideas* of colours are innate in a creature to whom God has given eyesight, which is a power to get those ideas through the eyes from external objects. It would be equally unreasonable to explain our knowledge of various *truths* in terms of innate ‘imprinting’ if it could just as easily be explained through our ordinary abilities to come to know things. Anyone who follows his own thoughts in the search of truth, and is led even slightly off the path of common beliefs, is likely to be criticized for this; and I expect to be criticized for saying that none of our intellectual possessions are innate. So I shall present the reasons that made me doubt the truth of the innateness doctrine. That will be my excuse for my mistake, if that’s what it is. Whether it is a mistake can be decided by those who are willing, as I am, to welcome truth wherever they find it.

2. Nothing is more commonly taken for granted than that certain principles, both speculative [= ‘having to do with what is the case’] and practical [= ‘having to do with morality, or what *ought*

to be the case] are accepted by all mankind. Some people have argued that because these principles are (they think) universally accepted, they must have been stamped onto the souls of men from the outset.

3. This argument from universal consent has a defect in it. Even if it were in fact true that all mankind agreed in accepting certain truths, that wouldn’t prove them to be innate if universal agreement could be explained in some other way; and I think it can.

4. Worse still, this *argument from universal consent* which is used to prove that there are innate principles can be turned into a proof that there are none; because there aren’t any principles to which all mankind give universal assent. I shall begin with speculative principles, taking as my example those much vaunted logical principles •‘Whatever is, is’ and •‘It is impossible for the same thing to be and not to be’, which are the most widely thought to be innate. They are so firmly and generally believed to be accepted by everyone in the world that it may be thought strange that anyone should question this. Yet I am willing to say that these propositions, far from being accepted by everyone, have never even been heard of by a great part of mankind.

5. Children and idiots have no thought—not an inkling—of these principles, and that fact alone is enough to destroy the universal assent that any truth that was genuinely innate would have to have. For it seems to me nearly a contradiction to say that there are truths imprinted on the soul that it doesn’t perceive or understand—because if ‘imprinting’ means anything it means making something be perceived: to imprint anything on the mind without the mind’s perceiving it seems to me hardly intelligible. So if children and idiots have souls, minds, with those principles imprinted on them, they can’t help perceiving them and assenting to them. Since

they don't do that, it is evident that the principles are not innately impressed upon their minds. If they were naturally imprinted, and thus innate, how could they be unknown? To say that a notion is imprinted on the mind, *and* that the mind is ignorant of it and has never paid attention to it, is to make this impression nothing. No proposition can be said to be in the mind which it has never known or been conscious of. It may be said that a proposition that the mind has never consciously known may be 'in the mind' in the sense that the mind is *capable* of knowing it; but in that sense *every true proposition that the mind is capable of ever assenting to may be said to be 'in the mind' and to be imprinted!* Indeed, there could be 'imprinted on' someone's mind, in *this* sense, truths that the person never did and never will know. For a man may be capable of knowing, and indeed of knowing with certainty, many things that he doesn't in fact come to know at any time in his life. So if the mere *ability* to know is the natural impression philosophers are arguing for, all the truths a man ever comes to know will have to count as innate; and this great doctrine about 'innateness' will come down to nothing more than a very improper way of speaking, and not something that disagrees with the views of those who deny innate principles. For nobody, I think, ever denied that the mind was capable of knowing many truths. Those who think that •all knowledge is acquired ·rather than innate· also think that •the *capacity* for knowledge is innate. If these words 'to be in the understanding' are used properly, they mean 'to be understood'. Thus, to be in the understanding and not be understood—to be in the mind and never be perceived—amounts to saying that something *is* and *is not* in the mind or understanding. If therefore these two propositions, •'Whatsoever is, is' and •'It is impossible for the same thing to be and not to be' are imprinted by nature, children cannot be ignorant of them; infants and all who have souls

must necessarily have them in their understandings, know the truth of them, and assent to that truth.

6. To avoid this conclusion, it is usually answered that *all men know and assent to these truths when they come to the use of reason*, and this is enough to prove the truths innate. I answer as follows.

7. People who are in the grip of a prejudice don't bother to look carefully at what they say; and so they will say things that are suspect—indeed almost meaningless—and pass them off as clear reasons. The foregoing claim ·that innateness is proved by assent-when-reason-is-reached·, if it is to be turned into something clear and applied to our present question, must mean either **1** that as soon as men come to the use of reason these supposedly innate truths come to be known and observed by them, or **2** that the use and exercise of men's reason assists them in the discovery of these truths, making them known with certainty.

8. If they mean **2** that by the use of reason men may discover these principles, and that this is sufficient to prove them innate, they must be arguing for this conclusion:

Whatever truths reason can enable us to know for certain, and make us firmly assent to, are all ·innate, i.e.· naturally imprinted on the mind;

on the grounds that universal assent proves innateness, and that all we mean by something's being 'universally assented to' in this context is merely that we can come to know it for sure, and be brought to assent to it, by the use of reason. This line of thought wipes out the distinction between the *maxims* [= 'basic axioms'] of the mathematicians and the *theorems* they deduce from them; all must equally count as innate because they can all be known for certain through the use of reason.

9. How can people who take this view think that we need to use *reason* to discover principles that are supposedly innate? We may as well think that the use of reason is necessary to make our *eyes discover visible objects* as that we need to have (or to use) reason to make the *understanding see what is originally engraved on it* and cannot be in the understanding before being noticed by it. ‘Reason shows us those truths that have been imprinted’—this amounts to saying that the use of reason enables a man to learn what he already knew.

10. In reply to my final remark in section 8, it may be said that maxims and other innate truths *are*, whereas mathematical demonstrations and other non-innate truths *are not*, assented to as soon as the question is put. . . . I freely acknowledge that maxims differ from mathematical demonstrations in this way: we grasp and assent to the latter only with the help of reason, using proofs, whereas the former—the basic maxims—are embraced and assented to as soon as they are understood, without the least reasoning. But so much the worse for the view that reason is needed for the discovery of these general truths [= maxims], since it must be admitted that reasoning plays no part in *their* discovery. And I think those who take this view ·that innate truths are known by reason· will hesitate to assert that the knowledge of the maxim that *it is impossible for the same thing to be and not to be* is a deduction of our reason. For by making our knowledge of such a principle depend on the labour of our thoughts they would be destroying that bounty of nature they seem so fond of. In all reasoning we search and flail around, having to take pains and stick to the problem. What sense does it make to suppose that all *this* is needed to discover something that was imprinted ·on us· by nature?

11. It is therefore utterly false that reason assists us in the knowledge of these maxims; and ·as I have also been

arguing·, if it were true it would prove that they are *not* innate!

12. Of the two interpretations mentioned in section 7, I now come to the one labelled **1**. If by ‘knowing and assenting to them when we come to the use of reason’ the innatists mean that this is *when* the mind comes to notice them, and that *as soon as* children acquire the use of reason they come also to know and assent to these maxims, this also is •false and •frivolous. •It is false because these maxims are obviously not in the mind as early as the use of reason. We observe ever so many instances of the use of reason in children long before they have any knowledge of the maxim that *it is impossible for the same thing to be and not to be*. Similarly with illiterate people and savages. . . .

13. All that is left for these innatists to claim is this: Maxims or innate truths are never known or noticed before the use of reason, and *may* be assented to at some time after that, but there is no saying *when*. But that is true of all other knowable truths; so it doesn’t help to mark off innately known truths from others.

14. Anyway, even if it were true that certain truths came to be known and assented to at *precisely* the time when men acquire the use of reason, that wouldn’t prove them to be innate. To argue that it would do so is as •frivolous as the premise of the argument is •false. [Locke develops that point at some length. How, he demands, can x’s innateness be derived from the premise that a person first knows x when he comes to be able to reason? Why not derive something’s innateness from its being first known only when a person comes to be able to *speak*? (Or, he might have added even more mockingly, when a person first becomes able to *walk*? or to *sing*?) He allows *some* truth to the thesis that basic general maxims are not known to someone who doesn’t yet

have the use of reason, but he explains this in terms not of innateness but rather of a theory of his own that he will develop later in the work. It rests on the assumption—which Locke doesn't declare here—that to *think* a general maxim one must have general *ideas*, and that to *express* a general maxim one must be able to use general *words*. Then:] The growth of reason in a person goes along with his becoming able to form *general abstract ideas*, and to understand *general names* [= 'words']; so children usually don't have such general ideas or learn the ·general· names that stand for them until after they have for a good while employed their reason on familiar and less general ideas; and it is during that period that their talk and behaviour shows them to be capable of rational conversation.

[Sections **15** and **16** continue with this theme. A typical passage is this, from section 16:] The later it is before anyone comes to have those general ideas that are involved in ·supposedly innate· maxims, or to know the meanings of the general words that stand for them, or to put together in his mind the ideas they stand for; the later also it will be before he comes to assent to the maxims. . . . Those words and ideas are no more innate than is the idea of *cat* or of *weasel*. So the child must wait until time and observation have acquainted him with them; and *then* he will be in a fit state to know the truth of these maxims.

17. . . . Some people have tried to secure universal assent to the propositions they call *maxims* by saying they are generally assented to as soon as *they are proposed, and the terms they are proposed in are understood*. . . .

18. In answer to this, I ask whether prompt assent given to a proposition upon first hearing it and understanding the terms really is a certain mark of an innate principle? If so, then we must classify as innate *all* such propositions, in

which case the innatists will find themselves plentifully supplied with innate principles—including various propositions about numbers that everybody assents to at first hearing and understanding the terms. And not just numbers; for even the natural sciences contain propositions that are sure to meet with assent as soon as they are understood: •*Two bodies cannot be in the same place at the same time*· is a truth that a person would no more hesitate to accept than he would to accept •*It is impossible for the same thing to be and not to be*, •*White is not black*, or •*A square is not a circle*. If assent at first hearing and understanding the terms were a mark of innateness, we would have to accept as innate every •proposition in which different ideas are denied one of another. We would have legions of innate propositions of this one sort, not to mention all the others. . . . Now, I agree that a proposition is shown to be *self-evident* by its being promptly assented to by everyone who hears it and understands its terms; but self-evidence comes not from innateness but from a different source which I shall present in due course. There are plenty of self-evident propositions that nobody would be so fanciful as to claim to be innate.

19. Don't say that the less general self-evident propositions—*One and two are equal to three, Green is not red*, and so on—are accepted as the consequences of more general ones that are taken to be innate. Anyone who attends with care to what happens in the understanding will certainly find that the less general propositions are known for sure, and firmly assented to, by people who are utterly ignorant of those more general maxims; so the former can't be accepted on the strength of the latter.

[In section **20** Locke considers the claim that the less general self-evident truths are not 'of any great use', unlike the more general maxims that are called innate. He replies that no

reason has been given for connecting usefulness to innateness, and that in any case he is going to question whether the more general maxims *are* of any great use.]

21. Here is another objection to inferring a proposition's innateness from its being assented to by anyone who hears it and understands its terms. Rather than this being a sign that the proposition *is* innate, it is really a proof that it *isn't*. It is being assumed that people who understand and know other things are ignorant of these ·self-evident and supposedly innate· principles till they are proposed to them. But if they were innate, why would they need to be *proposed* in order to be assented to? Wouldn't their being in the understanding through a natural and original impression lead to their being known even *before* being proposed? Or does proposing them print them *more clearly* in the mind than nature did? If so, then a man knows such a proposition better after he has been thus taught it—that is, had it clarifyingly 'proposed' to him—than he did before. This implies that these principles may be made more evident to us by others' teaching than nature has made them by impression; which deprives supposedly innate principles of their authority, and makes them unfit to be the foundations of all our other knowledge, as they are claimed to be. . . .

[Section **22** briefly and unsympathetically discusses the suggestion that even before a man first has an innate maxim 'proposed' to him, he has an *implicit* knowledge of it.]

[In section **23** Locke argues that the position he is now opposing—that a proposition counts as innate if it is assented to when first proposed and understood—looks plausible only because it is assumed that when the proposition is proposed and made to be understood *nothing new* is learned; that assumption might lead Locke's opponents to say that he was wrong in section 21 to say that such propositions are

taught. Against this he says:] In truth they *are* taught, and ·in such teaching the pupils· do learn something they were ignorant of before. They have learned the terms and their meanings, neither of which were born with them; and they have acquired the relevant ideas, which were not born with them any more than their names were. [Locke then presents at some length his own view about what really happens when someone assents to a self-evident proposition; all this will be developed further in Book II.]

24. To conclude this argument about universal consent, I agree with these defenders of innate principles that *if they are innate they must have universal assent*. (I can no more make sense of a truth's being innate and yet not assented to than I can of a man's knowing a truth while being ignorant of it.) But it follows that they can't be innate, because they are not universally assented to, as I have shown. . . .

25. It may be objected that I have been arguing from the thoughts of infants, drawing conclusions from what happens in their understandings, whereas we really don't know what their thoughts are. [Locke at some length just denies this, claiming that we do know a good deal about the thoughts of children. The section ends thus:] The child certainly knows that the wormseed or mustard it refuses is not the apple or sugar it cries for: this it is certainly and undoubtedly assured of. But will anyone say that the child has this knowledge by virtue of the principle *It is impossible for the same thing to be and not to be*? Someone who says that children join in these general abstract speculations with their sucking bottles and their rattles can fairly be thought to have less sincerity and truth than an infant, even if he outdoes the child in his passion and zeal for his opinion!

[Section **26** winds up that whole line of argument.]

[Section **27** advances a new argument. The innatist must allow that the truths innately implanted in our minds don't always present themselves to our consciousness, and he is forced to explain that this happens because our innately given intellectual possessions may be smudged over, 'corrupted by custom or borrowed opinions, by learning and education'. But if that were right, those innate truths 'should appear fairest and clearest' in the minds of 'children, idiots, savages, and illiterate people'; yet in such people 'we find no footsteps of them'.] One would think, according to the innatists' principles, that all these native beams of light (if they existed) would shine out most brilliantly in people who are not skilled in concealing things, leaving us in no more doubt of *their* having them than we are of their loving pleasure and hating pain. But alas, amongst children, idiots, savages, and the grossly illiterate, what general maxims are to be found? What universal principles of knowledge? Their notions are few and narrow, borrowed only from the objects they have had most to do with, and which have most frequently and strongly impressed themselves upon their senses. . . .

28. I don't know how absurd my position on this may seem to logicians; and probably most people will find it, on a first hearing, hard to swallow. So I ask for a little truce with prejudice, and a holding off from criticism, until I have been heard out in the later parts of this Book. I am very willing to submit to better judgments. Since I impartially search after truth, I shan't mind becoming convinced that I have been too fond of my own notions; which I admit we are all apt to be when application and study have excited our heads with them. . . .

Chapter i: Ideas in general, and their origin

1. Everyone is conscious to himself that he thinks; and when thinking is going on, the mind is engaged with *ideas* that it contains. So it's past doubt that men have in their minds various ideas, such as are those expressed by the words 'whiteness', 'hardness', 'sweetness', 'thinking', 'motion', 'man', 'elephant', 'army', 'drunkenness', and others. first question, then, is *How does he acquire these ideas?* It is widely believed that men have ideas stamped upon their minds in their very first being. My opposition to this in Book I will probably be received more favourably when I have shown where the understanding *can* get all its ideas from—an account that I contend will be supported by everyone's own observation and experience.

2. Let us then suppose the mind to have no ideas in it, to be like *white paper* with nothing written on it. How then does it come to be written on? From where does it get that vast store which the busy and boundless imagination of man has painted on it—all the materials of reason and knowledge? To this I answer, in one word, from *experience*. understandings derive all the materials of thinking from *observations* that we make of •external objects that can be perceived through the senses, and of •the internal operations of our minds, which we perceive by looking in at ourselves. These two are the fountains of knowledge, from which arise all the ideas we have or can naturally have.

3. First, our senses when applied to particular perceptible objects convey into the mind many distinct perceptions of things, according to the different ways in which the objects affect them. That's how we come by the ideas we have of yellow, white, heat, cold, soft, hard, bitter, sweet, and all

so on—the so-called 'sensible qualities'. When I say the senses convey these ideas into the mind, I don't mean this strictly and literally, because I don't mean to say that an idea actually *travels across* from the perceived object to the person's mind. Rather I mean that through the senses external objects convey into the mind *something that produces there* those perceptions [= 'ideas']. This great source of most of the ideas we have I call SENSATION.

4. Secondly, the other fountain from which experience provides ideas to the understanding is the perception of the operations of our own mind within us. This yields ideas that couldn't be had from external things—ones such as the ideas of perception, thinking, doubting, believing, reasoning, knowing, willing, and all the different things that our minds do. Being conscious of these actions of the mind and observing them in ourselves, our understandings get from them ideas that are as distinct as the ones we get from bodies affecting our senses. Every man has this source of ideas wholly within himself; and though it is not *sense*, because it has nothing to do with external objects, it is still very like sense, and might properly enough be called 'internal sense'. But along with calling the other 'sensation', I call this REFLECTION, because the ideas it gives us can be had only by a mind reflecting on its own operations within itself. By 'reflection' then, in the rest of this work, I mean the notice that the mind takes of *what* it is doing, and *how*. (I am here using 'operations' in a broad sense, to cover not only the *actions* of the mind on its ideas but also *passive states* that can arise from them, such as is the satisfaction or uneasiness arising from any thought.) So that's my thesis: all our ideas take their beginnings from those two sources—external material things as objects of sensation, and the operations of our own minds as objects of reflection.

5. When we have taken a full survey of •the ideas we get from these sources, and of their various modes, combinations, and relations, we shall find they are •our whole stock of ideas; and that we have nothing in our minds that didn't come in one of these two ways. [Locke then challenges the reader to 'search into his understanding' and see whether he has any ideas other than those of sensation and reflection.]

6. If you look carefully at the state of a new-born child, you'll find little reason to think that he is well stocked with ideas that are to be the matter of his future knowledge. He gets ideas gradually; and though the ideas of obvious and familiar qualities imprint themselves before the memory begins to keep a record of when or how, ideas of unusual qualities are different. Some of *them* come so late that most people can remember when they first had them. And if we had reason to, we *could* arrange for child to be brought up in such a way as to have very few ideas, even ordinary ones, until he had grown to manhood. In actuality children are born into the world surrounded by bodies that perpetually affect them so as to imprint on their minds a variety of ideas: light and colours are busy everywhere, as long as the eyes are open; sounds and some tangible qualities engage the senses appropriate to them, and force an entrance into the mind. But I think you'll agree that if a child were kept in a place where he never saw any colour but black and white till he was a man, he would have no ideas of scarlet or green—any more than a person has an idea of the taste of oysters or of pineapples if he has never actually tasted either.

7. How many simple ideas a person has depends •for ideas of sensation• on what variety there is among the external objects that he perceives, and •for ideas of reflection• on how much he reflects on the workings of his own mind. •The focussed intensity of the reflection is relevant, because•:

although someone who contemplates the operations of his mind can't help having plain and clear ideas of them, he won't have clear and distinct ideas of all the operations of his mind and everything that happens in them *unless he turns his thoughts that way and considers them attentively*; any more than he can have ideas of all the details of a landscape painting, or of the parts and motions of a clock, if he doesn't look at it and focus his attention on all the parts of it. The picture or clock may be so placed that he encounters them every day, but he'll have only a confused idea of all the parts they are made up of, until he applies himself with attention to consider each part separately.

8. That's why most children don't get ideas of the operations of their own minds until quite late, and why some people *never* acquire any very clear or perfect ideas of most of their mental operations. Their mental operations are there all the time, like floating visions; but until the understanding turns inward upon itself, reflects on them, and makes them the objects of its own thoughts, they won't make deep enough impressions to leave in the person's mind clear, distinct, lasting ideas. Children enter the world surrounded by new things that constantly attract their senses, beckoning to a mind that is eager to notice new things and apt to be delighted with the variety of changing objects. So the first years are usually spent in looking outwards •at the surroundings•; and so people grow up constantly attending to outward sensation, reflecting very little on what happens within them till they come to be of riper years—and some not even then.

9. When does a man first have any ideas? That is the same as asking: when does a man begin to perceive? For having ideas and perception are the same thing. I know that some philosophers hold that the soul [= 'mind'; no religious implications] *always* thinks, and that it has the actual perception

body that when thinking ‘apart’ from the body. He evidently thinks that this is an intolerable conclusion.]

[In sections **17–22** Locke continues to urge the empirical implausibility of the thesis that the soul always thinks, and the unreasonable dogmatism of those who insist on it as necessarily true whatever experience may say. Much of the content of these sections repeats things said earlier in the chapter. The discussion gradually moves over to Locke’s thesis that the soul thinks only when it has ideas to think with, and to his view about how ideas are acquired. And so the chapter circles back to where it was in section 9.]

23. When does a man begin to have any ideas? I think the true answer is: when he first has some sensation. Since there appear not to be any ideas in the mind before the senses have conveyed any in, I think that ideas in the understanding arise at the same time as sensation. Sensation is •an impression or motion made in some part of the body that produces •some perception in the understanding. It is about these impressions made on our senses by outward objects that the mind seems first to employ itself in such operations as we call perception, remembering, consideration, reasoning, etc.

24. In time the mind comes to reflect on *its own dealing with* the ideas acquired from *sensation*, and thereby stores up a new set of ideas that I call ideas of *reflection*. . . . The first capacity of human intellect is that the mind is fitted to receive the impressions made on it, either through the senses by outward objects, or by its own operations when it reflects on them. This is the first step a man makes towards the discovery of anything, and the basis on which to build all the notions he will ever have naturally in this world. All those sublime thoughts that tower above the clouds and reach as high as heaven itself take off from here. . . .

25. In the getting of ideas the understanding is merely passive. It has no control over whether it will have these beginnings—these materials, so to speak—of knowledge. For many of the objects of our senses shove their particular ideas into our minds, whether we want them or not; and the operations of our minds won’t let us be without at least *some* obscure notions of them. No man can be wholly ignorant of what he does when he thinks. The understanding can no more refuse to have these simple ideas when they are offered to it, or alter them once they have been imprinted, or blot them out and make new ones itself, than a mirror can refuse, alter, or obliterate the images or ideas that the objects placed in front of it produce on its surface. . . .

Chapter ii: Simple ideas

1. To get a better grasp of what our knowledge is, how it comes about, and how far it reaches, we must carefully attend to one fact about our ideas, namely that some of them are *simple*, and some *complex*. The *qualities* that affect our senses are intimately united and blended in the things themselves, but it is obvious that the *ideas* they produce in the mind enter (via the senses) simple and unmixed. A single sense will often take in different ideas from one object at one time—as when a man *sees* motion and colour together, or the hand *feels* softness and warmth in a single piece of wax—and yet the simple ideas that are thus brought together in a single mind are as perfectly distinct as those that come in by different senses. The •coldness and hardness a man feels in a piece of ice are as distinct ideas in the mind as the •smell and whiteness of a lily, or as the •taste of sugar and smell of a rose. And nothing can be plainer to a man than the clear and distinct perception he has of those simple ideas,

each of which contains nothing but one uniform appearance or conception in the mind, and is not distinguishable into different ideas.

2. These simple ideas, which are the materials of all our knowledge, are suggested and supplied to the mind only by sensation and reflection. Once the understanding has been stocked with these simple ideas, it is able to repeat, compare, and unite them, to an almost infinite variety, and so can make new complex ideas as it will. But no-one, however quick and clever, can invent one new simple idea that wasn't taken in by one of those two ways. Nor can any force of the understanding destroy those that are there. Man's power over this little world of his own understanding is much like his power over the great world of visible things, where he can only compound and divide the materials that he finds available to him, and can't do anything towards making the least particle of new matter, or destroying one atom of what already exists. . . .

3. God could have made a creature with organs different from ours, and more ways than our five senses to give the understanding input from bodily things. But I don't think any of us could imagine any qualities through which bodies could come to our attention other than sounds, tastes, smells, and visible and tangible qualities. Had mankind been made with only four senses, the qualities that are now the objects of the fifth sense would have been as far from our notice, imagination, and conception as now any belonging to a sixth, seventh, or eighth sense can possibly be. (Actually, I think that perhaps we do have six senses; but I have been following the usual count, which is five; it makes no difference to my present line of thought.) Are there creatures in some other parts of this vast and stupendous universe who have more senses than we do? Perhaps. If you consider

the immensity of this structure, and the great variety that is to be found in our little part of it, you may be inclined to think that there are somewhere different intelligent beings whose capacities are as unknown to you as are the senses or understanding of a man to a worm shut up in one drawer of a desk. Such variety and excellence would be suitable to the wisdom and power of our maker.

Chapter iii: Ideas of one sense

1. We shall get a better grasp of the ideas we receive from sensation if we classify them according to their different ways of getting into our minds.

First, some come into our minds by one sense only. Secondly, others enter the mind by more senses than one. Thirdly, yet others are had from reflection only. Fourthly, some are suggested to the mind by all the ways of sensation and reflection.

We shall consider them separately, under these headings. First, some ideas are admitted through only one sense, which is specially adapted to receive them. Thus •light and colours come in only by the eyes, all kinds of •noises, sounds, and tones only by the ears; the various •tastes and •smells by the nose and palate. If these organs, or the nerves that are the channels along which they communicate with the brain, become disordered so that they don't perform their functions, the associated ideas have no door through which to enter, no other way to bring themselves into view and be perceived by the understanding. The main ones belonging to touch are •heat and cold, and •solidity. Most of the others have to do with perceptible •texture, like smooth and rough, or with more or less firm •hanging together of the parts, like hard and soft, tough and brittle.

2. I needn't enumerate all the simple ideas belonging to each sense. Indeed, I can't do so because there are many more of them than we have names for. Kinds of smell are at least as numerous as kinds of bodies in the world, and few of them have names. We use 'sweet' and 'stinking' for them, but this amounts to little more than calling them pleasing or displeasing; the smell of a rose differs greatly from that of a violet, though both are sweet. [Similarly—Locke goes on to say—with tastes, and with colours and sounds.] In my account of simple ideas, therefore, I shall pick out only a few—mainly ones that are most important for my over-all enquiry. I shall also discuss some that tend to be overlooked, though they are very frequently ingredients in our complex ideas. I think this is the case with *solidity*, which is my next topic.

Chapter iv: Solidity

1. We receive the idea of solidity by the sense of touch. It arises from our experience of a body's resisting the entrance of any other body into the place it occupies. There is no idea that we receive more constantly from sensation than solidity. Whether moving or at rest, we always feel something under us that supports us and stops us from sinking further downwards; and we have daily experience of how, when holding a body between our two hands, the body absolutely prevents the hands from touching one another. My name for the property whereby one body blocks two others from touching is *solidity*. (Mathematicians use that term in a different sense, but mine is close enough to ordinary usage to be acceptable. If you prefer to call the property *impenetrability*, go ahead; but I prefer *solidity* for two reasons. •It is close to common speech. •The term 'impenetrability' seems to refer not to

the property itself but to a consequence of it, and a negative one at that; whereas 'solidity' means something positive and points to the property itself, not a mere consequence of it.) *Solidity* seems to be the idea that is most intimately connected with and essential to *body*. senses notice it only in masses of matter that are big enough to cause a sensation in us; but once the mind has acquired this idea from such large bodies, it traces the idea further and considers it (as well as shape) in the minutest particle of matter that can exist. •Not only can we not imagine matter without solidity, but we cannot imagine solidity to exist anywhere except in matter.

2. Solidity is the idea [here = 'quality'] of body whereby we conceive body to *fill space*. The idea of filling of space is this: we imagine a space taken up by a solid substance which we conceive it to *possess* in such a way that all other solid substances are excluded from it. . . .

3. This resistance whereby a body keeps other bodies out of its space is so great that no force, however great, can overcome it. All the bodies in the world, pressing a drop of water on all sides, can never overcome its resistance until it is moved out of their way. This distinguishes our idea of solidity both from (a) pure space, which is not capable of resistance or motion, and from (b) the ordinary idea of hardness. •I shall deal with (a) now, and with (b) in the next section. My target in (a) is Descartes, who held that whatever is extended is material, so that vacuum—understood as something extended and immaterial—is conceptually impossible. I shall discuss this at length in xiii, merely sketching my case against it here. •We can conceive two bodies at a distance as being able to meet and touch one another, without touching or displacing any other solid thing. This, I think, gives us a clear idea of space without solidity. Can we not

have the idea of one single body moving without any other immediately taking its place? Clearly we can, for •the idea of motion in one body doesn't include •the idea of motion in another—any more than •the idea of squareness in one body includes •the idea of squareness in another! I'm not asking whether in the actual state of the world it is *physically possible* for one body to move while no others do; answering this either way would be taking a side on the debate over whether there is a vacuum. All I am asking is whether we can have *the idea of* one body moving while no others do; and I think everyone will answer that we can. If so, then the place the body leaves gives us the *idea of* pure space without solidity, into which any other body can enter without being resisted and without displacing anything. If it is the case that *when the piston in a pump is pulled up, other matter has to take its place*, that comes from the world's being full, not from the mere *ideas* of space and solidity. . . . The very fact that people argue about whether there actually is a vacuum shows that they have ideas of space without a body.

Chapter v: Simple ideas of different senses

The ideas we get by more than one sense are of space, or extension, shape, rest, and motion; for these are perceivable by sight and touch. And we can receive and convey into our minds the ideas of bodies' extension, shape, motion, and rest both by seeing and feeling. I shall have more to say about these later.

Chapter vi: Simple ideas of reflection

1. After receiving ideas from outside, the mind looks in upon itself and observes its own dealings with the ideas it already has, and that gives it further ideas that are as fit to have a role in its thinking as any of those it received from outward things.
2. The main things the mind *does*, encountered so often that everyone who wants to can find them in himself, are perception or thinking, and volition or willing.

The power of *thinking* is called the *understanding*, and the power of *volition* is called the *will*; and these two powers or abilities in the mind are called 'faculties'. I shall later discuss some of the modes [= 'special kinds'] of these simple ideas of reflection, such as remembrance, discerning, reasoning, judging, knowledge, faith.

Chapter vii: Simple ideas of both sensation and reflection

1. Some other simple ideas convey themselves into the mind by all the ways of sensation and reflection—namely
 - pleasure or delight, and its opposite:
 - pain or uneasiness
 - power
 - existence
 - unity.
2. Nearly every other idea, whether of sensation or reflection, is accompanied by either delight or uneasiness. And almost any state of our senses caused from outside ourselves, and any thought of our mind within, can produce pleasure or pain in us. By the terms 'pleasure' and 'pain' I signify whatever delights or displeases us, whether it arises from the thoughts of our minds or anything operating on our bodies. For whether we call it 'satisfaction', 'delight', 'pleasure', 'happiness', etc. on the one side; or 'uneasiness', 'trouble', 'pain', 'torment', 'anguish', 'misery', etc. on the other; they are merely different degrees of the same thing, and belong to the ideas of pleasure and pain, delight or uneasiness, these being the names I shall most commonly use for those two sorts of ideas.

3. The infinite wise author of our being has given us •the power to move or not move certain parts of our bodies, and through those movements to move other neighbouring bodies. And he has also given to our mind •a power often to choose which of its ideas it will think of, and which line of enquiry to pursue with consideration and attention. That is why he—God—has seen fit to accompany various thoughts and various sensations with a perception of delight. If delight were wholly separated from all our outward sensations and inward thoughts, we would have no reason to prefer one thought or action to another, prefer negligence to attention, or prefer movement to rest. And so we would neither stir our bodies nor employ our minds, but let our thoughts drift along without direction or design. . . . A man in that state, however equipped with understanding and will, would be a very idle, inactive creature, and pass his time in a lazy, lethargic dream. . . .

4. Pain is as effective as pleasure in making us active, because we will work as hard to avoid pain as to get pleasure. It is interesting to note that pain is often produced by the same objects and ideas as produce pleasure in us. . . . Heat is very agreeable to us in one degree, but becomes extraordinarily painful when the temperature goes up a little. And the most pleasant of all perceptible things, light itself, causes a very painful sensation if its intensity is too great for our eyes. This shows the wisdom of our maker: when any object acts so intensely on our sense organs that it threatens to damage their delicate structures, pain warns us to withdraw before the organ is so damaged as to become useless. There is evidence that this is what pain is *for*. Although great light is insufferable to our eyes, yet the highest degree of darkness does them no harm and isn't accompanied by pain. In contrast with that: we are given pain by excess of cold as well as

of heat, because the two extremes are equally destructive to the bodily condition that is necessary for the preservation of life and the proper functioning of the body. It is the condition of having a moderate degree of warmth—or, if you will, a motion of the imperceptible parts of our bodies that is not too fast and not too slow.

[Section **5** suggests another reason, a theological one, why 'God has scattered up and down various levels of pleasure and pain in all the things that surround and affect us'. Section **6** gives a theological reason for discussing this.]

7. *Existence* and *unity* are two other ideas that are suggested to the understanding by every object outside us and every idea within. When ideas are in our minds, we consider them as being actually there, i.e. as *existing*; and whatever we can consider as one thing, whether a real being or an idea, suggests to the understanding the idea of *unity*, i.e. *oneness*.

8. *Power* is another simple idea that we receive from sensation and reflection. For we get the idea of power in two ways: •by observing in ourselves that we can at pleasure move various parts of our bodies that were at rest, and •by our constantly observing through our senses the effects that natural bodies can have on one another.

9. Another idea that is suggested by our senses but is more constantly offered to us by what happens in our minds, is the idea of *succession*. If we look into ourselves and reflect on what we observe there, we'll find our ideas following one another with no interruptions throughout our waking hours.

10. I think that these are all—or anyway the most important—of the mind's simple ideas, out of which all its other knowledge is made. They are all received through sensation and reflection. Don't think that sensation and

reflection are too narrow to supply all the materials of the capacious mind of man, which takes its flight beyond the stars, roaming beyond the world of matter out into incomprehensible empty space. It won't seem so strange to think that these few simple ideas suffice for the quickest thought, or largest mental capacity, if we consider how many words we can make by putting together various selections from twenty-four letters, or if we consider how the mathematicians can get an inexhaustible and truly infinite stock of material out of just one of the simple ideas I have mentioned, namely *number*. [In fact Locke hasn't mentioned it yet. It will be the topic of xvi.]

7. To reveal the nature of our ideas better, and to talk about them intelligibly, it will be convenient to distinguish them •as they are ideas or perceptions in our minds, and •as they are states of matter in the bodies that cause such perceptions in us. That may save us from the belief (which is perhaps the common opinion) that the ideas are exactly the images and resemblances of something inherent in the object. That belief is quite wrong. Most ideas of sensation are (in the mind) no more *like* a thing existing outside us than the names that stand for them are *like* the ideas themselves.

8. Whatever the mind perceives in itself—whatever is the immediate object of perception, thought, or understanding—I

call an *idea*; and the power to produce an idea in our mind I call a *quality* of the thing that has that power. Thus a snow-ball having the power to produce in us the ideas of white, cold, and round, the powers to produce those ideas in us, as they are in the snow-ball, I call *qualities*; and as they are sensations or perceptions in our understandings, I call them *ideas*. If I sometimes speak of ‘ideas’ as in the things themselves, please understand me to mean to be talking about the *qualities* in the objects that produce them in us.

9. Qualities thus considered in bodies are of two kinds. First, there are those that are utterly inseparable from the body, whatever state it is in. Qualities of this kind are the ones that a body doesn’t lose, however much it alters, whatever force is used on it, however finely it is divided. Take a grain of wheat, divide it into two parts, each part has still solidity, extension, shape, and mobility; divide it again, and it still retains those qualities; go on dividing it until the parts become imperceptible, each part must still retain all those qualities. . . . I call them original or *primary qualities* of body, which I think we may observe to produce simple ideas in us, viz. solidity, extension, shape, motion or rest, and number.

10. Secondly, there are qualities that are, in the objects themselves, really nothing but *powers to produce various sensations in us by their primary qualities*, i.e. by the size, shape, texture, and motion of their imperceptible parts. Examples of these are colours, sounds, tastes, and so on. I call these *secondary qualities*. To these we can add a third sort, an example of which is the power of fire to change the colour or consistency of wax and clay. This would ordinarily be said to be *only a power in* rather than *a quality of* the object; but it is just as much a real quality as the powers that I have called ‘secondary qualities’. (I call them ‘qualities’ so as to comply with the common way of speaking, and add

‘secondary’ to mark them off from the rest.) The primary qualities of fire—that is, the size, texture, and motion of its minute parts—give it a power to affect *wax and clay* etc.; and those same primary qualities give it a power to produce in *me* a sensation of warmth or burning; if the latter is a quality in the fire, why not the former also?

11. The next question is: How do bodies produce ideas in us? Obviously they do it by impact; we can’t conceive bodies to operate in any way but that.

12. External objects are not united [= ‘directly connected’] to our mind when they produce ideas in it, and yet we do somehow perceive qualities in the objects. Clearly there has to be some motion that goes from the object to our sense-organs, and from there is continued by our nerves or our animal spirits to the brains or the seat of sensation, there to produce in our mind the particular ideas we have of them. [Locke held the then-common view that human physiology involves ‘animal spirits’. These constitute the body’s hydraulic system (Bernard Williams’s phrase)—an *extremely* finely divided fluid that transmits pressures through tiny cracks and tunnels.] Since the extension, shape, number, and motion of visible bodies can be seen from a distance, it is evident that some bodies that are too small to be seen individually must travel from those bodies across to the eyes, and thereby convey to the brain some motion that produces in us these ideas that we have of them.

13. We may conceive that the ideas of secondary qualities are also produced by the operation of insensible particles on our senses. Plainly there are plenty of bodies that are so small that we can’t, by any of our senses, discover the size, shape, or motion of any one of them taken singly. The particles of the air and water are examples of this, and there are others still smaller—perhaps as much smaller than particles of air

and water as the latter are smaller than peas or hail-stones. Let us suppose in the meantime that the different motions and shapes, sizes and number of such particles, affecting our various sense-organs, produce in us the different sensations that we have of the colours and smells of bodies. . . . It is no more impossible to conceive that God should attach such ideas to motions that in no way *resemble* them than it is that he should attach the idea [= 'feeling'] of pain to the motion of a piece of steel dividing our flesh, which in no way resembles the pain.

14. What I have said about colours and smells applies equally to tastes and sounds, and other such sensible qualities. Whatever reality we mistakenly attribute to them, they are really nothing in the objects themselves but powers to produce various sensations in us. These powers depend, as I have said, on those primary qualities, namely size, shape, texture, and motion of parts.

15. From this we can easily infer that the ideas of the primary qualities of bodies resemble them, and their patterns really do exist in the bodies themselves; but the ideas produced in us by secondary qualities don't resemble them at all. There is nothing *like* our ideas of secondary qualities existing in the bodies themselves. All they are in the bodies is *a power to produce those sensations in us*. What is sweet, blue, or warm in idea is nothing but the particular size, shape, and motion of the imperceptible parts in the bodies that we call 'sweet', 'blue', or 'warm'.

16. Flame is called 'hot' and 'light'; snow 'white' and 'cold'; and manna 'white' and 'sweet'—all from the ideas they produce in us. [We know that Locke sometimes calls qualities 'ideas', but that seems not to be enough to explain the oddity of the next sentence down to its first comma. The passage as given here is almost verbatim Locke; all of the oddity is there in what he wrote.] Those qualities are

commonly thought to be the same in those bodies as those ideas are in us, the one perfectly resembling the other; and most people would think it weird to deny this. But think about this: a fire at one distance produces in us the sensation of •warmth, and when we come closer it produces in us the very different sensation of •pain; what reason can you give for saying that the idea of *warmth* that was produced in you by the fire *is actually in* the fire, without also saying that the idea of *pain* that the same fire produced in you in the same way *is in* the fire? Why are whiteness and coldness in snow, and pain not, when it produces each idea in us, and can do so only through the size, shape, number, and motion of its solid parts?

17. The particular size, number, shape, and motion of the parts of fire or snow are really in them, whether or not anyone's senses perceive them. So they may be called *real* qualities, because they *really* exist in those bodies; but light, heat, whiteness or coldness are no more really in them than sickness or pain is in manna. Take away the sensation of them—

let the eyes not see light or colours, or the ears hear sounds; let the palate not taste, or the nose smell—
and all colours, tastes, odours, and sounds vanish and cease, and are reduced to their causes, i.e. size, shape, and motion of parts.

18. A big enough piece of manna can produce in us the idea of a round or square shape, and, by being moved, the idea of motion. This idea of motion represents motion as it really is in the moving manna; a circle or square is the same •in idea as •in existence—the same •in the mind as •in the manna—and this motion and shape really are in the manna, whether or not we notice them. Everybody agrees with this. On the other hand, manna by virtue of the size,

shape, texture, and motion of its parts has a power to produce in us the sensations of sickness and sometimes of acute pains. And everyone agrees also that •these ideas of sickness and pain are *not* in the manna, are only effects of its operations on us, and are *nowhere* when we don't feel them. Yet it is hard to get people to agree that •sweetness and whiteness aren't really in manna either, and are also merely the effects of the operations of manna by the motion, size, and shape of its particles on the eyes and palate. . . . It would be hard for them to explain why the •ideas produced by the eyes and palate should be thought to be really in the manna, while •those produced by the stomach and guts are not; or why •the pain and sickness caused by the manna should be thought to be nowhere when they aren't felt, while •the sweetness and whiteness of it should be thought to exist in the manna even when they aren't seen or tasted.

19. Consider the red and white colours in porphyry. Prevent light from reaching the stone, and its colours vanish, it no longer produces any such ideas in us; when light returns, it produces these appearances in us again. Can anyone think that any real alterations are made in the porphyry by the presence or absence of light; and that those ideas of whiteness and redness are really in porphyry in the light, when it obviously has no colour in the dark? The porphyry has at *every* time a configuration of particles that is apt to produce in us the idea of redness when rays of light rebound from some parts of that hard stone, and to produce the idea of whiteness when the rays rebound from some other parts; but at *no* time are whiteness or redness in the stone.

20. Pound an almond, and the clear white colour will be altered into a dirty one, and the sweet taste into an oily one. What real alteration can the beating of the pestle make in any body other than an alteration of the texture of it?

21. We are now in a position to explain how it can happen that the same water, at the same time, produces the idea of cold by one hand and of heat by the other; whereas the same water couldn't possibly be at once hot and cold if those ideas were really in it. If we imagine warmth in our hands to be nothing but a certain sort and degree of motion in the minute particles of our nerves or animal spirits, we can understand how it is possible for the same water at the same time to produce the sensations of heat in one hand and of cold in the other (which shape never does; something never feels square to one hand and spherical to the other). If the sensation of heat and cold is nothing but the increase or lessening of the motion of the minute parts of our bodies, caused by the corpuscles of some other body, we can easily understand that if motion is greater in one hand than in the other, and the two hands come into contact with a body that is intermediate between them in temperature, the particles in one hand will be slowed down while those of the other will speed up, thus causing different sensations.

22. In what I have been saying I have gone a little further than I intended into physical enquiries. [That is, into questions about the biology/psychology of ideas, questions about what *actually happens in the world* when ideas of a certain kind occur.] But I had to throw a little light on the nature of sensation, and to provide a firm grasp of how qualities in bodies differ from the ideas they produce in the mind; for without this I couldn't write intelligibly about ideas. I hope I shall be pardoned this little detour into natural science. . . .

23. So the qualities that are in bodies are of three sorts. First, the size, shape, number, position, and motion or rest of their solid parts; those are in them, whether or not we perceive them; and when they are big enough for us to perceive them they give us our idea of what kind of thing

it is—as clearly happens with artifacts. For example, we recognize a clock or a coach from how its visible parts are assembled, without need for guesswork about its submicroscopic features. I call these *primary qualities*. Secondly, the power that a body has, by reason of its imperceptible primary qualities, to operate in a special way on any of our senses, thereby producing in us the different ideas of various colours, sounds, smells, tastes, etc. These are usually called *sensible qualities*. I call them secondary qualities. Thirdly, the power that a body has, by virtue of the particular set-up of its primary qualities, to change the size, shape, texture or motion of another body so as to make the latter operate on our senses differently from how it did before. Thus the sun has a power to make wax white, and fire to make lead fluid. These are usually called *powers*. The first of these, I repeat, may be properly called real, original, or primary qualities, because they are in the things themselves, whether or not they are perceived. It is upon different modifications of them that the secondary qualities depend. [A ‘modification’ of a quality is a special case of it, a quality that involves it and more. Squareness is a modification of shapedness, which is a modification of extendedness.] The other two are only powers to act differently on other things, which powers result from the different modifications of those primary qualities.

24. But though the two latter sorts of qualities are merely powers, nothing else, one of the two sorts are generally thought of as something else. The second sort, namely the powers to produce ideas in us by our senses, are looked on as real qualities in the things thus affecting us. The third sort are regarded as mere powers: when we consider the sun in relation to wax that it melts or blanches, we look on the wax’s whiteness and softness not as qualities in the sun but as effects produced by powers in the sun. This correct

understanding of the third sort of qualities is also right for the second sort. If rightly considered, the qualities of light and warmth that are perceptions in me when I am warmed or lit up by the sun are no more *in the sun* than are the changes made in the wax when it is blanched or melted. . . .

[Section **25** is a fairly long and somewhat complex explanation of why people are apt to think correctly about powers and incorrectly about secondary qualities. Section **26** winds up the chapter without adding anything except the suggestion that the second sort of qualities ‘may be called secondary qualities, immediately perceivable’, and the third sort ‘secondary qualities, mediately perceivable’.]

Chapter ix: Perception

- 1.** Just as perception is the mind’s first way of engaging with ideas, the idea of it is the first and simplest idea we have from reflection. Some call it *thinking*, but that is a misnomer, because in correct English ‘thinking’ stands only for operations on ideas in which the mind is *active*, coming to bear on something with some degree of voluntary attention. In bare naked perception, on the other hand, the mind is mostly passive, perceiving only what it can’t avoid perceiving.
- 2.** What is *perception*? you’ll know the answer to that better by reflecting on what *you* do when you see, hear, feel, etc. or think, than by listening to anything I say. Whoever reflects on what happens in his own mind can’t miss it; and if he doesn’t reflect, all the words in the world can’t make him have any notion of it.
- 3.** This much is certain: whatever alterations occur in the body, if they don’t reach the mind there is no perception. Whatever impressions are made on the outward parts, if

they aren't taken notice of •within there is no perception. Fire may burn our bodies with no other effect than it makes on a piece of wood, unless the motion is continued to the brain, and there the sense of heat, or idea of pain, is produced in the mind. In that consists actual perception.

4. Your own experience will tell you that quite often your mind, while intently focussed on some things and on the ideas they involve, takes no notice of the effects that other things are having on the organ of hearing, although these effects are just like ones that ordinarily produce the idea of sound. There may be a sufficient impact on the organ, but because it isn't observed by the mind no perception ensues. The motion that ordinarily produces the idea of sound is made in the ear, yet no sound is heard. In this case the lack of sensation doesn't come from any defect in your organ of hearing, or from your ears' being less affected than at other times when you do hear. Rather, it is that the physical effects aren't *taken notice of in the understanding*, and so they don't imprint any idea on the mind, and so they cause no sensation. Whenever there is sense or perception, some idea is actually produced and present in the understanding.

5. So I am sure that children, by the exercise of their senses on objects that affect them in the womb, receive a few ideas before they are born If I may risk a guess on a matter that isn't very open to investigation, I think the ideas of hunger and warmth are among them—probably among the first that children have, and hardly ever part with.

6. But though we can reasonably suppose that children receive some ideas before they are born, these •simple ideas are nothing like the •innate principles that I have rejected. •The former come from states that the child's body is in, or events that its body undergoes, while it is in the womb; which means that they depend on something exterior to the

mind. In their way of being produced they differ from other sense-based ideas *only* in that they occur earlier. As against this, •innate principles are supposed to be of an entirely different sort—not coming into the mind through any particular events in the body, but original characters stamped onto it from the outset.

7. As there are some ideas—like the feelings of hunger and warmth—that we can reasonably suppose to be introduced into the minds of children in the womb, reflecting the necessities of their life in that situation, so the first ideas that are imprinted on them after they are born are the sensible qualities that first impinge on them. *Light* is a powerful example. Newly born children always turn their eyes in the direction from which the light comes, which is some evidence of how greedy the mind is to get as many ideas as it can, so long as they aren't accompanied by pain. But children's circumstances vary, and so the order in which they acquire ideas varies too; and this isn't something we have much need to enquire into.

8. Speaking of adults now: the ideas we receive by *sensation* are often altered by *judgment* without our noticing it. When we see a round uniformly coloured globe—say of gold or alabaster or polished coal—it is certain that the idea it imprints on our mind is of a flat circle variously shadowed, with various degrees of light and brightness coming to our eyes. But we know how convex bodies customarily appear to us, how the reflections of light are altered by the shapes of bodies; and so our judgment acquires a habit of immediately *altering the appearances into their causes*. Faced with something that is really a variety of shadow or colour, it infers what the shape is; takes that variety to be a mark of that shape; and forms for itself the perception of *a convex figure and a uniform colour*, although the idea we receive is only a

plane variously coloured, as is evident in painting. A propos of that, I shall here insert a problem that was put to me by the learned and worthy Mr. Molineux. . . .:

Suppose a man born blind, now adult, who has learned how to distinguish by touch between a cube and a sphere of the same metal and about the same size, so that he can tell when he handles them which is the cube and which the sphere. Now suppose the cube and sphere to be placed on a table, and the blind man be made to see. Can he by his sight, before touching them, tell which is the globe, which the cube?

To this Mr Molineux answers No. For though the man has obtained the experience of how a globe affects his sense of touch and how a cube does, he still has no experience telling him that something that affects his touch *thus* must affect his sight *so*. I agree I leave this with you, to prompt you to consider how much you owe to experience, learning, and acquired notions, where you have thought you hadn't the least help from them! I especially want to include this question here because Mr Molyneux tells me that when the first edition of my book appeared he proposed this question to various very able men, and found hardly any that gave what he thinks is the right answer until he convinced them of it by giving reasons.

9. This mistake doesn't happen much, I think, with ideas other than those received by sight. Here is why it happens with them. Sight, which is the most comprehensive of all our senses, conveys to our minds the ideas of light and colours, which we get only from that sense; and it conveys also the very different ideas of space, shape, and motion, the variations in which bring with them changes in the appearances of light and colours; and so we become accustomed

to judging one by the other. When this is done with things of which we have frequent experience, it is performed so constantly and so quickly that we take an idea formed by our judgment to be a perception of our sensation; so that the latter serves only to trigger the former, and is hardly noticed in itself. Similarly, a man who reads or hears with attention and understanding takes little notice of the letters or sounds, attending only to the ideas that they rouse up in him.

[In section **10** Locke comments on our generally not noticing that we are making such a substitution. He explains it partly as resulting from the speed with which the substitution is performed ('As the mind is thought to take up no space, so its actions seem to require no time') and from its habitualness. He compares it with our unawareness of blinking.]

11. The faculty of perception seems to me to be what distinguishes the animal kingdom from the inferior parts of nature, that is, from plants. A good many plants are capable of motion: when other bodies are applied to them they briskly alter their shapes and motions, which leads to their being called 'sensitive plants' because their movements somewhat resemble those that an animal makes because of some sensation that it has. But in plants it is (I suppose) all bare mechanism, produced in the same kind of way as water produces the shortening of a rope—which is done without any sensation in the subject or any having or receiving of ideas.

12. I believe that perception occurs to some extent in animals of every sort, though it may be that in some animals the inlets that nature provides for receiving sensations are so few, and the perception they are received with is so dark and dull, that it falls far short of the sharpness and variety of sensation in other animals. Still, it is sufficient for, and wisely adapted to, the state and condition of animals of that

sort. So the wisdom and goodness of the Maker plainly appear in all the parts of this stupendous structure, and at all the different levels of creatures in it.

13. Judging by an oyster's structure, I think we can reasonably conclude that it doesn't have as many senses—or ones as keen—as men and many other animals have; and because of its immobility it wouldn't be better off if it did. What good would sight and hearing do to a creature that couldn't move itself towards benefit or away from harm even if it could see them at a distance? And wouldn't keenness of sensation be an inconvenience to an animal that must lie still, where chance has once placed it, and be washed over by whatever water—cold or warm, clean or foul—that happens to come its way?

14. Still, I can't help thinking that oysters have some small dull perception that distinguishes their state from perfect insensibility. [Locke goes on to liken this conjectured state of an oyster to the state of an extremely old man who has lost most of his memories, and is blind, deaf, and without a sense of smell.]

15. Because perception is the first step towards knowledge, and is the inlet through which all its materials come into the mind, the following is the case. •The fewer senses any man (or other creature) has, •the fewer and duller the impressions are that his senses make; and •the duller the faculties are that he brings to bear on them, •the more remote he is from having the sort of knowledge that is to be found in some men. But there are so many different levels of this (even amongst men) that we can't know for sure where a given species of animals stands in this respect, much less where an individual animal stands. . . .

Chapter xii: Complex ideas

1. So far we have considered only •ideas that the mind receives passively, namely •the simple ones that come to it from sensation and reflection. The mind can't make any such simple idea for itself, and can't have any idea that doesn't wholly consist of them. But while the mind is wholly *passive* in the reception of all its simple ideas, it *acts* in various ways to construct other ideas out of its simple ones, which are the materials and foundations of all the rest. The acts in which the mind exerts its power over its simple ideas are chiefly these three: **1** Combining several simple ideas into one compound one; that is how all complex ideas are made. **2** Bringing together two ideas, whether simple or complex, setting them side by side so as to see them both at once,

without uniting them into one; this is how the mind gets all its ideas of relations. **3** Separating them from all other ideas that accompany them in their real existence; this is called abstraction, and it is how all the mind's general ideas are made. This shows that the power a man has, and his exercise of it, are pretty much the same in the intellectual world as in the material one. In neither realm has he any power to make or destroy any raw materials; all he can do is either to •unite them together, or •set them side by side, or •wholly separate them. (For example, he cannot make or destroy rocks, but he can assemble them to make a wall, or dismantle a wall that has been made from them.) I shall begin with *uniting*, and shall come to the other two in due course. As simple ideas are observed to exist in various combinations united together, so the mind has a power to consider several of them united together as one idea; not only in combinations that exist in external objects, but also in ones the mind makes up. Ideas thus made up of several simple ones I call *complex*. Examples are the ideas of beauty, gratitude, a man, an army, the universe. These are all complex ideas made up of simple ones, but the mind can if it wishes treat each of them by itself as one unified thing, signified by one name.

2. By being able to repeat and join together its ideas, the mind has great power to vary and multiply the objects of its thoughts, infinitely beyond what sensation or reflection provides it with. . . . The basic raw materials of all its compositions are simple ideas received from those two sources—the mind has no other way of getting any—but once it has acquired these simple ideas it can by its own power put together the ideas it has, making new complex ones that it never received united in that way.

3. Complex ideas, however compounded and decompounded, are infinitely numerous and endlessly various. Still, I think

they can all be brought under three headings: **1** Modes. **2** Substances. **2** Relations.

4. First, *modes* are complex ideas that don't contain within them the supposition of •existing by themselves, but are considered as •dependences on or states of substances. Examples are the ideas signified by the words 'triangle', 'gratitude', 'murder', etc. (These words stand for dependences on substances because: if there is a triangle that is because *something* is triangular, if gratitude occurs that is because *someone* is grateful, if there is a murder that is because *someone* murders someone.) Forgive me if I am here using the word 'mode' in somewhat a different sense from its ordinary one. When presenting a view that involves notions different from any that people commonly have, one must either invent new words or use old ones with somewhat new meanings; and in the present case the latter is perhaps the more tolerable of the two procedures.

5. Two sorts of modes deserve to be considered separately. •Some are only variations or different combinations of the same simple idea, not mixed in with any other. For example, the ideas of *dozen* and *score* are nothing but the ideas of so many distinct units added together. I call these *simple modes*, because they are contained within the bounds of one simple idea. It should be remembered that a *simple mode* is, like all modes, a *complex idea*. •Others are made up of simple ideas of different kinds, put together to make one complex one. Examples are *beauty* (a certain composition of colour and figure, causing delight to the beholder), and *theft* (the concealed change of the possession of something without its owner's consent, which obviously combines several ideas of different kinds). I call these *mixed modes*.

6. Secondly, the ideas of *substances* are combinations of simple ideas that are taken to represent distinct particular

things existing by themselves. In such combinations the supposed or confused idea of *substance*, such as it is, is always the first and chief. Thus if to the idea of *substance* we join the simple idea of a certain dull whitish colour, and ideas of certain degrees of weight, hardness, ductility, and fusibility, we have the idea of *lead*; and a combination of the ideas of a certain shape with mobility, thought, and reasoning, joined to *substance*, makes the ordinary idea of a *man*. Ideas of substances also fall into two sorts: •ideas of single substances as they exist separately, for example the idea of a man or of a sheep; and •ideas of several of those put together, such as the idea of an army of men, or of a flock of sheep. An idea of the latter collective kind—an idea, that is, of several substances put together—is as much one single

idea as is the idea of a man.

7. Thirdly, the last sort of complex idea is the one we call *relation*, which consists in considering and comparing one idea with another. I shall discuss these different kinds in their order, taking simple modes in chapters xii-xxi, complex or 'mixed' modes in xxii, substances in xxiii-xxiv, and relations in xxv-xxviii.

[In section **8** Locke makes some wind-up remarks about the intellectual riches that we can get by operating, in the ways he has described, on the simple ideas we get from our outer and inner senses. He remarks that he'll illustrate this in his treatments of 'the ideas we have of space, time, and infinity and a few others that *seem* the most remote from' simple sense-based ideas.]

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 dura-

tion 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.