with some few sensible obvious qualities, and often, if not always, leave out others as material and as firmly united as those that they take. [. . .]

32. *The more general our ideas are, the more incomplete and partial they are.* If the *number of simple* ideas *that make the nominal essence* of the lowest *species*, or first sorting, of individuals *depends on the mind* of man variously collecting them, it is much more evident that they do so in the more comprehensive *classes*, which, by the masters of logic are called *genera*. These are complex *ideas* designedly imperfect; and it is visible at first sight that several of those qualities that are to be found in the things themselves are purposely left out of *generical ideas*. For, as the mind, to make general *ideas* comprehending several particulars, leaves out those of time, and place, and such other that make them incommunicable to more than one individual, so to make other yet more general *ideas*, that may comprehend different sorts, it leaves out those qualities that distinguish them, and puts into its new collection only such *ideas* as are common to several sorts. [. . .]

36. *Though nature makes the similitude.* This then, in short, is the case: *Nature makes many particular things which do agree* one with another in many sensible qualities, and probably too in their internal frame and constitution; but it is not this real essence that distinguishes them into *species*; it is *men* who, taking occasion from the qualities they find united in them, and in which they observe often several individuals to agree, *range them into sorts, in order to their naming*, for the convenience of comprehensive signs; under these individuals, according to their conformity to this or that abstract *idea*, come to be ranked as under ensigns: so that this is of the blue, that the red regiment; this is a man, that a drill; and in this, I think, consists the whole business of *genus* and *species*. [. . .]

Book IV. Of Knowledge and Opinion.
Chapter I. *Of Knowledge in General.*

1. *Our knowledge conversant about our* ideas. Since the *mind* in all its thoughts and reasonings has no other immediate object but its own *ideas*, which it alone does or can contemplate, it is evident that our knowledge is only conversant about them.

2. *Knowledge is the perception of the agreement, or disagreement, of two* ideas. *Knowledge* then seems to me to be nothing but *the perception of the connection and agreement, or disagreement and repugnance, of any of our ideas.* In this alone it consists. Where this perception is, there is knowledge, and where it is not, there, though we may fancy, guess, or believe, yet we always come short of knowledge. For when we know that *white is not black*, what do we else but perceive that these two *ideas* do not agree? When we possess ourselves with the utmost security of the demonstration that the *three angles of a triangle are equal to two right ones*, what do we more but perceive that equality to two right ones does necessarily agree to, and is inseparable from, the three angles of a triangle?

3. *This agreement fourfold.* But to understand a little more distinctly in what this agreement or disagreement consists, I think we may reduce it all to these four sorts.

1. *Identity* or *diversity*.

2. *Relation*.

3. *Coexistence* or *necessary connection*.

4. *Real existence*.

4. *First, of identity or diversity.* First, as to the first sort of agreement or disagreement, namely, *identity* or *diversity*. It is the first act of the mind, when it has any sentiments or *ideas* at all, to perceive its *ideas*; and so far as it perceives them, to know each what it is, and in this way also to perceive their difference, and that one is not another. This is so absolutely necessary that without it there could be no knowledge, no reasoning, no imagination, no distinct thoughts, at all. By this the mind clearly and infallibly perceives each *idea* to agree with itself, and to be what it is, and all distinct *ideas* to disagree, i.e., the one not to be the other. And this it does without pains, labor, or deduction, but at first view, by its natural power of perception and distinction. And though men of art have reduced this into those general rules, "*what is, is*," *and "it is impossible for the same thing to be and*

not to be," for ready application in all cases in which there may be occasion to reflect on it, yet it is certain that the first exercise of this faculty is about particular *ideas*. A man infallibly knows, as soon as ever he has them in his mind that the *ideas* he calls *white* and *round*, are the very *ideas* they are, and that they are not other *ideas* which he calls *red* or *square*. Nor can any maxim or proposition in the world make him know it clearer or surer than he did before, and without any such general rule. This then is the first agreement or disagreement which the mind perceives in its *ideas*, which it always perceives at first sight. And if there ever happens to be any doubt about it, it will always be found to be about the names, and not the *ideas* themselves, whose identity and diversity will always be perceived, as soon and clearly as the *ideas* themselves are; nor can it possibly be otherwise.

5. *Secondly, relation*. *Secondly*, the next sort of agreement or disagreement the mind perceives in any of its *ideas* may, I think, be called *relative*, and is nothing but *the perception of the relation between any two ideas*, of whatever kind, whether substances, modes, or any other. For since all distinct *ideas* must eternally be known not to be the same, and so be universally and constantly denied one of another, there could be no room for any positive knowledge at all, if we could not perceive any relation between our *ideas*, and find out the agreement or disagreement they have one with another, in several ways the mind takes of comparing them.

6. *Thirdly, of coexistence*. Thirdly, the third sort of agreement or disagreement to be found in our *ideas*, which the perception of the mind is employed about, is *coexistence*, or *non-coexistence* in the same subject, and this belongs particularly to substances. Thus when we pronounce concerning *gold* that it is fixed, our knowledge of this truth amounts to no more but this that fixedness, or a power to remain in the fire unconsumed, is an *idea* that always accompanies, and is joined with that particular sort of yellowness, weight, fusibility, malleableness, and solubility in *aqua regia*, which make our complex *idea*, signified by the word *gold*.

7. *Fourthly, of real existence*. Fourthly, the fourth and last sort is that of *actual real existence* agreeing to any *idea*. Within these four sorts of agreement or disagreement is, I suppose, contained all the knowledge we have, or are capable of. For all the inquiries we can make concerning any of our *ideas*, all that we know or can affirm concerning any of them, is that it is, or is not, the same with some other; that it does or does not always coexist with some other *idea* in the same subject; that it has this or that relation with some other *idea*; or that it has a real existence without the mind. Thus "*blue is not yellow*" is of identity. "*Two triangles upon equal bases between two parallels are equal*" is of relation. "*Iron is susceptible of magnetic impressions*" is of coexistence. "God *is*" is of real existence. Though identity and coexistence are truly nothing but relations, yet they are such peculiar ways of agreement or disagreement of our *ideas* that they deserve well to be considered as distinct heads, and not under relation in general, since they are so different grounds of affirmation and negation, as will easily appear to anyone who will but reflect on what is said in several places of this essay. I should now proceed to examine the several degrees of our knowledge, but that it is necessary first to consider the different acceptations of the word *knowledge*.

8. *Knowledge actual or habitual*. There are several ways in which the mind is possessed of truth, each of which is called *knowledge*.

1. There is *actual knowledge*, which is the present view the mind has of the agreement or disagreement of any of its *ideas*, or of the relation they have one to another.

2. A man is said to know any proposition, which having been once laid before his thoughts, he evidently perceived the agreement or disagreement of the *ideas* of which it consists, and so lodged it in his memory that whenever that proposition comes again to be reflected on, he, without doubt or hesitation, embraces the right side, assents to, and is certain of the truth of it. This, I think, one may call *habitual knowledge*. And thus a man may be said to know all those truths which are lodged in his memory, by a foregoing clear and full perception,

> of which the mind is assured past doubt as often as it has occasion to reflect on them. For our finite understandings being able to think clearly and distinctly but on one thing at once, if men had no knowledge of any more than what they actually thought on, they would all be very ignorant; and he who knew most would know but one truth, that being all he was able to think on at one time.

9. *Habitual knowledge twofold*. Of habitual knowledge there are also, vulgarly speaking, two degrees.

First, the one is of *such truths laid up in the memory as, whenever they occur to the mind, it actually perceives the relation between those ideas*. And this is in all those truths of which we have an *intuitive knowledge*, where the *ideas* themselves, by an immediate view, discover their agreement or disagreement one with another.

Secondly, the other is of *such truths of which the mind having been convinced, it retains the memory of the conviction, without the proofs*. Thus a man who remembers certainly that he once perceived the demonstration that the three angles of a triangle are equal to two right ones is certain that he knows it, because he cannot doubt the truth of it. In his adherence to a truth where the demonstration by which it was at first known is forgot—though a man may be thought rather to believe his memory than really to know, and this way of entertaining a truth seemed formerly to me like something between opinion and knowledge, a sort of assurance which exceeds bare belief, for that relies on the testimony of another—yet upon a due examination I find it does not come short of perfect certainty and is in effect true knowledge; that which is apt to mislead our first thoughts into a mistake in this matter is that the agreement or disagreement of the *ideas* in this case is not perceived, as it was at first, by an actual view of all the intermediate *ideas*, by which the agreement or disagreement of those in the proposition was at first perceived, but by other intermediate *ideas* that show the agreement or disagreement of the *ideas* contained in the proposition whose certainty we remember. For example, in this proposition that "the three angles of a triangle are equal to two right ones," one who has seen and clearly perceived the demonstration of this truth knows it to be true, when that demonstration is gone out of his mind, so that at present it is not actually in view and possibly cannot be recollected. But he knows it in a different way from what he did before. The agreement of the two *ideas* joined in that proposition is perceived, but it is by the intervention of other *ideas* than those which at first produced that perception. He remembers, i.e., he knows (for remembrance is but the reviving of some past knowledge), that he was once certain of the truth of this proposition that the three angles of a triangle are equal to two right ones. The immutability of the same relations between the same immutable things is now the *idea* that shows him that if the three angles of a triangle were once equal to two right ones, they will always be equal to two right ones. And hence he comes to be certain that what was once true in the case is always true; what *ideas* once agreed will always agree; and consequently what he once knew to be true, he will always know to be true, as long as he can remember that he once knew it. Upon this ground it is that particular demonstrations in mathematics afford general knowledge. If then the perception that the same *ideas* will eternally have the same habitudes and relations is not a sufficient ground of knowledge, there could be no knowledge of general propositions in mathematics, for no mathematical demonstration would be any other than particular. And when a man had demonstrated any proposition concerning one triangle or circle, his knowledge would not reach beyond that particular diagram. If he would extend it further, he must renew his demonstration in another instance, before he could know it to be true in another like triangle, and so on. By these means one could never come to the knowledge of any general propositions. Nobody, I think, can deny that Mr. *Newton* certainly knows any proposition that he now at any time reads in his book to be true, though he does not have in actual view that admirable chain of intermediate *ideas* by which he at first discovered it to be true. Such a memory as that, able to retain such a train of particulars, may be well thought beyond the reach of human faculties, when the very discovery, perception, and laying

together that wonderful connection of *ideas* is found to surpass most readers' *comprehension*. But yet it is evident the author himself knows the proposition to be true, remembering he once saw the connection of those *ideas*, as certainly as he knows such a man wounded another, remembering that he saw him run him through. But because the memory is not always so clear as actual perception and does in all men more or less decay in length of time, this among other differences is one which shows that *demonstrative knowledge* is much more imperfect than *intuitive*, as we shall see in the following chapter.

Chapter II. *Of the Degrees of Our Knowledge.*

1. *Intuitive*. All our knowledge consisting, as I have said, in the view the mind has of its own *ideas*, which is the utmost light and greatest certainty we, with our faculties, and in our way of knowledge, are capable of, it may not be amiss to consider a little the degrees of its evidence. The different clearness of our knowledge seems to me to lie in the different way of perception the mind has of the agreement or disagreement of any of its *ideas*. For if we will reflect on our own ways of thinking, we shall find that sometimes the mind perceives the agreement or disagreement of two *ideas* immediately by themselves, without the intervention of any other. And this, I think, we may call *intuitive knowledge*. For in this the mind is at no pains of proving or examining, but perceives the truth, as the eye does light, only by being directed towards it. Thus the mind perceives that *white* is not *black*, that a *circle* is not a *triangle*, that *three* are more than *two*, and equal to *one* and *two*. Such kinds of truths the mind perceives at the first sight of the *ideas* together, by bare *intuition*, without the intervention of any other *idea*; and this kind of knowledge is the clearest and most certain that human frailty is capable of. This part of knowledge is irresistible, and like bright sunshine forces itself immediately to be perceived, as soon as ever the mind turns its view that way, and leaves no room for hesitation, doubt, or examination, but the mind is presently filled with the clear light of it. It is on this *intuition* that depends all the certainty and evidence of all our knowledge; this certainty everyone finds to be so great that he cannot imagine and therefore not require a greater. For a man cannot conceive himself capable of a greater certainty than to know that any *idea* in his mind is such as he perceives it to be, and that two *ideas* in which he perceives a difference are different and not precisely the same. He who demands a greater certainty than this, demands he knows not what, and shows only that he has a mind to be a skeptic, without being able to be so. Certainty depends so wholly on this intuition that in the next degree of *knowledge*, which I call *demonstrative*, this intuition is necessary in all the connections of the intermediate *ideas*, without which we cannot attain knowledge and certainty.

2. *Demonstrative*. The next degree of knowledge is where the mind perceives the agreement or disagreement of any *ideas*, but not immediately. Though wherever the mind perceives the agreement or disagreement of any of its *ideas*, there is certain knowledge; yet it does not always happen that the mind sees that agreement or disagreement which there is between them, even where it is discoverable, and in that case remains in ignorance, and at most gets no further than a probable conjecture. The reason why the mind cannot always perceive presently the agreement or disagreement of two *ideas* is because those *ideas*, concerning whose agreement or disagreement the inquiry is made, cannot by the mind be so put together as to show it. In this case then, when the mind cannot so bring its *ideas* together, as by their immediate comparison and as it were juxtaposition or application one to another, to perceive their agreement or disagreement, it is inclined, by the intervention of other *ideas* (one or more, as it happens) to discover the agreement or disagreement which it searches; and this is that which we call *reasoning*. Thus the mind, being willing to know the agreement or disagreement in bigness between the three angles of a triangle and two right ones, cannot by an immediate view and comparing them do it, because the three angles of a triangle cannot be brought at once and be compared with any other one or two angles; and so of this the mind has no immediate, no intuitive knowledge. In this case the mind is inclined to find out some other angles to which the three angles of a

triangle have an equality, and, finding those equal to two right ones, comes to know their equality to two right ones.

3. *Depends on proofs*. Those intervening *ideas*, which serve to show the agreement of any two others, are called *proofs*; and where the agreement or disagreement is by this means plainly and clearly perceived, it is called *demonstration*, it being *shown* to the understanding, and the mind made to see that it is so. A quickness in the mind to find out these intermediate *ideas* (that shall discover the agreement or disagreement of any other) and to apply them right is, I suppose, that which is called *sagacity*.

4. *But not so easy*. This knowledge by intervening proofs, though it is certain, yet the evidence of it is *not* altogether *so clear* and bright, nor the assent so ready, *as* in *intuitive* knowledge. For though in *demonstration* the mind does at last perceive the agreement or disagreement of the *ideas* it considers, yet it is not without pains and attention. There must be more than one transient view to find it. A steady application and pursuit are required to this discovery. And there must be a progression by steps and degrees before the mind can in this way arrive at certainty and come to perceive the agreement or repugnance between two *ideas* that need proofs and the use of reason to show it.

5. *Not without precedent doubt*. Another difference between intuitive and demonstrative knowledge is that though in the latter all doubt is removed when, by the intervention of the intermediate *ideas*, the agreement or disagreement is perceived, yet before the demonstration there was a doubt, which in intuitive knowledge cannot happen to the mind that has its faculty of perception left to a degree capable of distinct *ideas*, no more than it can be a doubt to the eye (that can distinctly see white and black) whether this ink and this paper are all of a color. If there is sight in the eyes, it will at first glimpse, without hesitation, perceive the words printed on this paper different from the color of the paper. And so if the mind has the faculty of distinct perception, it will perceive the agreement or disagreement of those *ideas* that produce intuitive knowledge. If the eye has lost the faculty of seeing, or the mind of perceiving, we in vain inquire after the quickness of sight in one, or clearness of perception in the other.

6. *Not so clear*. It is true the perception produced by *demonstration* is also very clear, yet it is often with a great abatement of that evident luster and full assurance that always accompany that which I call *intuitive*; like a face reflected by several mirrors one to another, where as long as it retains the similitude and agreement with the object, it produces a knowledge; but it is still, in every successive reflection, with a lessening of that perfect clearness and distinctness which is in the first; until at last, after many removes, it has a great mixture of dimness, and is not at first sight so knowable, especially to weak eyes. Thus it is with knowledge made out by a long train of proof.

7. *Each step must have intuitive evidence*. Now, *in every step reason makes in demonstrative knowledge, there is an intuitive knowledge* of that agreement or disagreement it seeks with the next intermediate *idea* which it uses as a proof; for if it were not so, that yet would need a proof, since without the perception of such agreement or disagreement, there is no knowledge produced. If it is perceived by itself, it is intuitive knowledge. If it cannot be perceived by itself, there is need of some intervening *idea*, as a common measure, to show their agreement or disagreement. By this it is plain that every step in reasoning that produces knowledge has intuitive certainty, which, when the mind perceives, there is no more required but to remember it, to make the agreement or disagreement of the *ideas* concerning which we inquire visible and certain. So that to make anything a *demonstration*, it is necessary to perceive the immediate agreement of the intervening *ideas*, by which the agreement or disagreement of the two *ideas* under examination (of which the one is always the first, and the other the last in the account) is found. This intuitive perception of the agreement or disagreement of the intermediate *ideas*, in each step and progression of the *demonstration*, must also be carried exactly in the mind, and a man must be sure that no part is left out—which because in long deductions and the use of many proofs the memory does not always so readily and exactly retain; therefore it comes to pass that this is more

imperfect than intuitive knowledge, and men embrace often falsehood for demonstrations. [. . .]

9. *Demonstration not limited to quantity*. It has been generally taken for granted that mathematics alone is capable of demonstrative certainty; but to have such an agreement or disagreement as may intuitively be perceived, being, as I imagine, not the privilege of the *ideas* of *number*, *extension*, and *figure* alone, it may possibly be the want of due method and application in us, and not of sufficient evidence in things, that demonstration has been thought to have so little to do in other parts of knowledge, and been scarcely so much as aimed at by any but mathematicians. For whatever *ideas* we have in which the mind can perceive the immediate agreement or disagreement that is between them, there the mind is capable of intuitive knowledge; and where it can perceive the agreement or disagreement of any two *ideas* by an intuitive perception of the agreement or disagreement they have with any intermediate *ideas*, there the mind is capable of demonstration, which is not limited to *ideas* of extension, figure, number, and their modes.

10. *Why it has been so thought*. The reason why it has been generally sought for, and supposed to be only in those, I imagine, has been not only the general usefulness of those sciences, but because, in comparing their equality or excess, the modes of numbers have every the least difference very clear and perceivable; and though in extension every the least excess is not so perceptible, yet the mind has found out ways to examine and discover demonstratively the just equality of two angles, or extensions, or figures. And both these, i.e., numbers and figures, can be set down by visible and lasting marks, in which the *ideas* under consideration are perfectly determined, which for the most part they are not, where they are marked only by names and words.

11. But in other simple *ideas*, whose modes and differences are made and counted by degrees, and not quantity, we have not so nice and accurate a distinction of their differences as to perceive, or find ways to measure, their just equality, or the least differences. For those other simple *ideas*, being appearances of sensations produced in us by the size, figure, number, and motion of minute corpuscles singly insensible, their different degrees also depend upon the variation of some or of all those causes, which, since it cannot be observed by us in particles of matter of which each is too subtle to be perceived, it is impossible for us to have any exact measures of the different degrees of these simple *ideas*. [. . .]

13. Not knowing therefore what number of particles, nor what motion of them is fit to produce any precise degree of *whiteness*, we cannot demonstrate the certain equality of any two degrees of *whiteness*; because we have no certain standard to measure them by, nor means to distinguish every the least real difference, the only help we have being from our senses, which in this point fail us. But where the difference is so great as to produce in the mind clearly distinct *ideas* whose differences can be perfectly retained, there these *ideas* or colors, as we see in different kinds, as blue and red, are as capable of demonstration as *ideas* of number and extension. What I have here said of *whiteness* and colors, I think, holds true in all secondary qualities and their modes.

14. *Sensitive knowledge of particular existence*. These two, namely, intuition and demonstration, are the degrees of our knowledge; whatever comes short of one of these, with whatever assurance embraced, is but faith or opinion, but not knowledge, at least in all general truths. There is, indeed, another *perception* of the mind, employed about *the particular existence of finite beings* without us, which going beyond bare probability, and yet not reaching perfectly to either of the foregoing degrees of certainty, passes under the name of knowledge. There can be nothing more certain than that the *idea* we receive from an external object is in our minds; this is intuitive knowledge. But whether there is anything more than barely that *idea* in our minds, whether we can certainly infer from this the existence of anything without us, which corresponds to that *idea*, is that of which some men think there may be a question made; because men may have such *ideas* in their minds when no such thing exists, no such object affects their senses. But yet here, I think, we are provided with an evidence that puts us past doubting. For I ask anyone whether he is not invincibly conscious to himself of a different

perception when he looks on the sun by day, and thinks on it by night—when he actually tastes wormwood, or smells a rose, or only thinks on that savor or odor? We as plainly find the difference there is between any *idea* revived in our minds by our own memory and actually coming into our minds by our senses, as we do between any two distinct *ideas*. If anyone says a dream may do the same thing, and all these *ideas* may be produced in us without any external objects, he may please to dream that I make him this answer: 1. That it is no great matter, whether I remove his scruple or not; where all is but dream, reasoning and arguments are of no use, truth and knowledge nothing. 2. That I believe he will allow a very manifest difference between dreaming of being in the fire and being actually in it. But yet if he is resolved to appear so skeptical, as to maintain that what I call being actually in the fire is nothing but a dream, and that we cannot thereby certainly know that any such thing as fire actually exists without us, I answer that we certainly find that pleasure or pain follows upon the application of certain objects to us, whose existence we perceive, or dream that we perceive by our senses; this certainty is as great as our happiness or misery, beyond which we have no concern to know or to be. Thus, I think, we may add to the two former sorts of *knowledge* this also, of the existence of particular external objects, by that perception and consciousness we have of the actual entrance of *ideas* from them, and allow these *three degrees of knowledge*, namely, *intuitive*, *demonstrative*, *and sensitive*, in each of which there are different degrees and ways of evidence and certainty.

15. *Knowledge not always clear, where the* ideas *are so*. But since our knowledge is founded on and employed about our *ideas* only, will it not follow from this that it is conformable to our *ideas*; and that where our *ideas* are clear and distinct, or obscure and confused, our knowledge will be so too? To which I answer, no. For our knowledge consisting in the perception of the agreement or disagreement of any two *ideas*, its clearness or obscurity consists in the clearness or obscurity of that perception, and not in the clearness or obscurity of the *ideas* themselves—e.g., a man who has as clear *ideas* of the angles of a triangle, and of equality to two right ones, as any mathematician in the world, may yet have but a very obscure perception of their agreement, and so have but a very obscure knowledge of it. But *ideas*, which by reason of their obscurity or otherwise, are confused, cannot produce any clear or distinct knowledge, because, as far as any *ideas* are confused, so far the mind cannot perceive clearly, whether they agree or disagree. Or to express the same thing in a way less apt to be misunderstood: he who has not determined *ideas* to the words he uses cannot make propositions of them of whose truth he can be certain.

Chapter III. *Of the Extent of Human Knowledge.*

1. *First, no further than we have* ideas. Knowledge, as has been said, lying in the perception of the agreement or disagreement of any of our *ideas*, it follows from hence that,

First, we can have *knowledge* no further than we have *ideas*.

2. *Secondly, no further than we can perceive their agreement or disagreement. Secondly* that we can have no *knowledge* further than we can have perceptions of that agreement or disagreement, which perception being: 1. either by *intuition*, or the immediate comparing any two *ideas*; or, 2. by *reason*, examining the agreement or disagreement of two *ideas*, by the intervention of some others; or, 3. by *sensation*, perceiving the existence of particular things. Hence it also follows:

3. *Thirdly, intuitive knowledge does not extend itself to all the relations of all our* ideas. *Thirdly* that we cannot have an *intuitive knowledge* that shall extend itself to all our *ideas*, and all that we would know about them, because we cannot examine and perceive all the relations they have one to another by *juxta*position, or an immediate comparison one with another. Thus having the *ideas* of an obtuse and an acute angled triangle, both drawn from equal bases, and between parallels, I can, by intuitive knowledge, perceive the one not to be the other, but cannot that way know whether they are equal or not, because their agreement or disagreement in equality can never be perceived by an immediate comparing of them. The

difference of figure makes their parts incapable of an exact immediate application; and therefore there is need of some intervening qualities to measure them by, which is demonstration or rational knowledge.

4. *Fourthly, nor demonstrative knowledge.* Fourthly, it follows also, from what is above observed that our *rational knowledge* cannot reach to the whole extent of our *ideas*, because between two different *ideas* we would examine, we cannot always find such *mediums* as we can connect one to another with an intuitive knowledge in all the parts of the deduction; and wherever that fails, we come short of knowledge and demonstration.

5. *Fifthly, sensitive knowledge, narrower than either. Fifthly, sensitive knowledge* reaching no further than the existence of things actually present to our senses is yet much narrower than either of the former.

6. *Sixthly, our knowledge, therefore, narrower than our* ideas. From all which it is evident that *the extent of our knowledge* comes not only short of the reality of things, but even of the extent of our own *ideas*. Though our knowledge is limited to our *ideas* and cannot exceed them either in extent or perfection, and though these are very narrow bounds, in respect of the extent of all being, and far short of what we may justly imagine to be in some even created understandings, not tied down to the dull and narrow information, is to be received from some few and not very acute ways of perception, such as are our senses, yet it would be well with us if our knowledge were but as large as our *ideas*, and there were not many doubts and inquiries concerning the *ideas* we have, of which we are not, nor I believe ever shall be in this world resolved. Nevertheless I do not question but that human knowledge, under the present circumstances of our beings and constitutions, may be carried much further than it has been up to now, if men would sincerely and with freedom of mind employ all that industry and labor of thought in improving the means of discovering truth, which they do for the coloring or support of falsehood to maintain a system, interest, or party, they are once engaged in. But yet after all, I think I may, without injury to human perfection, be confident that our knowledge would never reach to all we might desire to know concerning those *ideas* we have, nor be able to surmount all the difficulties and resolve all the questions that might arise concerning any of them. We have the *ideas* of a *square*, a *circle*, and *equality*, and yet, perhaps, shall never be able to find a circle equal to a square, and certainly know that it is so. We have the *ideas* of *matter* and *thinking*, but possibly shall never be able to know whether any mere material being thinks or not, it being impossible for us, by the contemplation of our own *ideas*, without revelation, to discover whether omnipotence has not given to some systems of matter fitly disposed a power to perceive and think, or else joined and fixed to matter so disposed a thinking immaterial substance—it being in respect of our notions not much more remote from our comprehension to conceive that God can, if he pleases, superadd to matter a faculty of thinking than that he should superadd to it another substance with a faculty of thinking, since we do not know in what thinking consists, nor to what sort of substances the Almighty has been pleased to give that power, which cannot be in any created being, but merely by the good pleasure and bounty of the Creator. For I see no contradiction in it that the first eternal thinking Being or omnipotent Spirit should, if he pleased, give to certain systems of created senseless matter, put together as he thinks fit, some degrees of sense, perception, and thought, though as I think I have proved, *lib. iv.* chap. 10, sec. 14, etc., it is no less than a contradiction to suppose matter (which is evidently in its own nature void of sense and thought) should be that eternal first-thinking being. What certainty of knowledge can anyone have that some perceptions, such as, e.g., pleasure and pain, should not be in some bodies themselves after a certain manner modified and moved, as well as that they should be in an immaterial substance upon the motion of the parts of body? Body, as far as we can conceive, being able only to strike and affect body, and motion, according to the utmost reach of our *ideas*, being able to produce nothing but motion; so that when we allow it to produce pleasure or pain, or the *idea* of a color or sound, we are inclined to quit our reason, go beyond our *ideas*, and attribute it wholly to the good pleasure of our Maker. For since we must allow he has annexed

effects to motion, which we can no way conceive motion able to produce, what reason have we to conclude that he could not order them as well to be produced in a subject we cannot conceive capable of them, as well as in a subject we cannot conceive the motion of matter can any way operate upon? I do not say this that I would any way lessen the belief of the soul's immateriality. I am not here speaking of probability, but knowledge; and I think not only that it becomes the modesty of philosophy not to pronounce magisterially where we want that evidence that can produce knowledge, but also that it is of use to us to discern how far our knowledge does reach, for the state we are at present in, not being that of vision, we must in many things content ourselves with faith and probability; and in the present question about the immateriality of the soul if our faculties cannot arrive at demonstrative certainty, we need not think it strange. All the great ends of morality and religion are well enough secured without philosophical proofs of the soul's immateriality, since it is evident that he who made us at the beginning to subsist here, sensible intelligent beings, and for several years continued us in such a state, can and will restore us to the like state of sensibility in another world, and make us capable there to receive the retribution he has designed to men, according to their doings in this life. And therefore it is not of such mighty necessity to determine one way or the other as some over-zealous for or against the immateriality of the soul have been ready to make the world believe. Who, either on the one side, indulging too much their thoughts, immersed altogether in matter, can allow no existence to what is not material. Or who, on the other side, not finding *cogitation* within the natural powers of matter, examined over and over again by the utmost intention of mind, have the confidence to conclude that omnipotence itself cannot give perception and thought to a substance which has the modification of solidity. He who considers how hardly sensation is, in our thoughts, reconcilable to extended matter, or existence to anything that has no extension at all, will confess that he is very far from certainly knowing what his soul is. It is a point which seems to me to be put out of the reach of our knowledge. And he who will give himself leave to consider freely, and look into the dark and intricate part of each hypothesis, will scarcely find his reason able to determine him fixedly for or against the soul's materiality. Since on whichever side he views it, either as an unextended substance or as a thinking extended matter, the difficulty to conceive either will, while either alone is in his thoughts, still drive him to the contrary side—an unfair way which some men take with themselves who, because of the inconceivableness of something they find in one, throw themselves violently into the contrary hypothesis, though altogether as unintelligible to an unbiased understanding. This serves not only to show the weakness and the scantiness of our knowledge, but the insignificant triumph of such sort of arguments, which, drawn from our own views, may satisfy us that we can find no certainty on one side of the question, but do not at all thereby help us to truth by running into the opposite opinion, which, on examination, will be found clogged with equal difficulties. For what safety, what advantage to anyone is it, for the avoiding the seeming absurdities, and to him insurmountable rubs he meets with in one opinion, to take refuge in the contrary, which is built on something altogether as inexplicable, and as far remote from his comprehension? It is past controversy that we have in us something that thinks; our very doubts about what it is confirm the certainty of its being, though we must content ourselves in the ignorance of what *kind* of being it is. And it is in vain to go about to be skeptical in this, as it is unreasonable in most other cases to be positive against the being of anything, because we cannot comprehend its nature. For I would gladly know what substance exists that does not have something in it which manifestly baffles our understandings. Other spirits who see and know the nature and inward constitution of things, how much must they exceed us in knowledge? To which if we add larger comprehension, which enables them at one glance to see the connection and agreement of very many *ideas*, and readily supplies to them the intermediate proofs, which we by single and slow steps, and long poring in the dark, hardly at last find out, and are often ready to forget one before we have hunted out another. We may

guess at some part of the happiness of superior ranks of spirits, who have a quicker and more penetrating sight, as well as a larger field of knowledge. But to return to the argument in hand, our *knowledge*, I say, is not only limited to the paucity and imperfections of the *ideas* we have and which we employ it about, but even comes short of that too. But how far it reaches, let us now inquire.

7. *How far our knowledge reaches*. The affirmations or negations we make concerning the *ideas* we have may, as I have before intimated in general, be reduced to these four sorts, namely, identity, coexistence, relation, and real existence. I shall examine how far our knowledge extends in each of these.

8. *First, our knowledge of identity and diversity, as far as our* ideas. *First, as to identity and diversity*, in this way of agreement or disagreement of our *ideas, our intuitive knowledge is as far extended as our ideas* themselves; and there can be no *idea* in the mind which it does not presently, by an intuitive knowledge, perceive to be what it is and to be different from any other.

9. *Secondly, of coexistence, a very little way. Secondly, as to* the second sort, which is *the agreement or disagreement* of our *ideas in coexistence*, in this our knowledge is very short, though in this consists the greatest and most material part of our knowledge concerning substances. For our *ideas* of the species of substances being, as I have showed, nothing but certain collections of simple *ideas* united in one subject, and so coexisting together: e.g., our *idea* of *flame* is a body hot, luminous, and moving upward; of *gold*, a body heavy to a certain degree, yellow, malleable, and fusible. These, or some such complex *ideas* as these in men's minds, stand for these two names of the different substances, *flame* and *gold*. When we would know anything further concerning these, or any other sort of substances, what do we inquire, but what other qualities or power these substances have or have not? This is nothing else but to know what other simple *ideas* do or do not coexist with those that make up that complex *idea*.

10. *Because the connection between most simple* ideas *is unknown*. This, however weighty and considerable a part of human science, is yet very narrow, and scarcely any at all. The reason of which is that the simple *ideas*, of which our complex *ideas* of substances are made up, are, for the most part, such as carry with them, in their own nature, no visible necessary connection or inconsistency with any other simple *ideas*, whose coexistence with them we would inform ourselves about.

11. *Especially of secondary qualities*. The *ideas* that our complex ones of substances are made up of, and about which our knowledge concerning substances is most employed, are those of their *secondary qualities*. These depending all (as has been shown) upon the primary qualities of their minute and insensible parts, or if not upon them, upon something yet more remote from our comprehension, it is impossible we should know which have a necessary union or inconsistency one with another. For not knowing the root they spring from, not knowing what size, figure, and texture of parts they are, on which depend, and from which result, those qualities which make our complex *idea* of *gold*, it is impossible we should know what other qualities result from, or are incompatible with, the same constitution of the insensible parts of gold, and so consequently must always coexist with that complex *idea* we have of it, or else are *inconsistent* with it.

12. *And further, because all connection between any secondary and primary qualities is undiscoverable*. Besides this ignorance of the primary qualities of the insensible parts of bodies, on which depend all their secondary qualities, there is yet another and more incurable part of ignorance, which sets us more remote from a certain knowledge of the *coexistence* or *in-coexistence* (if I may so say) of different *ideas* in the same subject, and that is, that there is no discoverable connection between any *secondary quality and those primary qualities* which it depends on.

13. That the size, figure, and motion of one body should cause a change in the size, figure, and motion of another body is not beyond our conception. The separation of the parts of one body upon the intrusion of another and the change from rest to motion upon impulse, these and the like seem to have some *connection* one with another. And if we knew these primary qualities of bodies, we might have reason to

hope we might be able to know a great deal more of these operations of them one upon another. But our minds not being able to discover any *connection* between these primary qualities of bodies and the sensations that are produced in us by them, we can never be able to establish certain and undoubted rules of the consequence or *coexistence* of any secondary qualities, though we could discover the size, figure, or motion of those invisible parts which immediately produce them. We are so far from knowing what figure, size, or motion of parts produce a yellow color, a sweet taste, or a sharp sound that we can by no means conceive how any *size*, *figure*, or *motion* of any particles can possibly produce in us the *idea* of any *color*, *taste*, or *sound* whatsoever; there is no conceivable *connection* between the one and the other.

14. In vain therefore shall we endeavor to discover by our *ideas* (the only true way of certain and universal knowledge) what other *ideas* are to be found constantly joined with that of our complex *idea* of any substance. Since we neither know the real constitution of the minute parts on which their qualities do depend, nor, did we know them, could we discover any necessary *connection* between them and any of the *secondary qualities*; which is necessary to be done before we can certainly know their *necessary coexistence*. So that, let our complex *idea* of any species of substances be what it will, we can hardly, from the simple *ideas* contained in it, certainly determine the necessary coexistence of any other quality whatsoever. Our knowledge in all these inquiries reaches very little further than our experience. Indeed, some few of the primary qualities have a necessary dependence and visible connection one with another, as figure necessarily supposes extension. Receiving or communicating motion by impulse supposes solidity. But though these and perhaps some others of our *ideas* have, yet there are so *few* of them that have a *visible connection* one with another that we can by intuition or demonstration discover the coexistence of very few of the qualities that are to be found united in substances. And we are left only to the assistance of our senses to make known to us what qualities they contain. For of all the qualities that are *coexistent* in any subject, without this dependence and evident connection of their *ideas* one with another, we cannot know certainly any two to *coexist* any further than experience, by our senses, informs us. Thus though we see the yellow color, and upon trial find the weight, malleableness, fusibility, and fixedness that are united in a piece of gold, yet because no one of these *ideas* has any evident *dependence* or necessary connection with the other, we cannot certainly know that where any four of these are, the fifth will be there also, however highly probable it may be, because the highest probability amounts not to certainty, without which there can be no true knowledge. For this *coexistence* can be no further known than it is perceived; and it cannot be perceived but either in particular subjects, by the observation of our senses, or in general, by the necessary *connection* of the *ideas* themselves.

15. *Of repugnance to coexist, larger. As to the incompatibility or repugnance to coexistence*, we may know that any subject may have of each sort of primary qualities but one particular at once: e.g., each particular extension, figure, number of parts, motion, excludes all other of each kind. The like also is certain of all sensible *ideas* peculiar to each sense, for whatever of each kind is present in any subject excludes all others of that sort: e.g., no one subject can have two smells or two colors at the same time. To this perhaps will be said, has not an opal, or the infusion of *lignum nephriticum*, two colors at the same time? To which I answer that these bodies, to eyes differently placed, may at the same time afford different colors. But I take liberty also to say that to eyes differently placed, it is different parts of the object that reflect the particles of light. And therefore it is not the same part of the object, and so not the very same subject, which at the same time appears both yellow and azure. For it is as impossible that the very same particle of any body should at the same time differently modify or reflect the rays of light, as that it should have two different figures and textures at the same time.

16. *Of the coexistence of powers, a very little way.* But *as to the powers of substances* to change the sensible qualities of other bodies, which make a great part of our inquiries about them, and is no inconsiderable

branch of our knowledge, I doubt, as to these, whether *our knowledge reaches* much further than our experience, or whether we can come to the discovery of most of these powers, and be certain that they are in any subject, by the connection with any of those *ideas* which to us make its essence. Because the active and passive powers of bodies, and their ways of operating, consisting in a texture and motion of parts, which we cannot by any means come to discover, it is but in very few cases we can be able to perceive their dependence on, or repugnance to, any of those *ideas* which make our complex one of that sort of things. I have here instanced in the corpuscularian hypothesis as that which is thought to go furthest in an intelligible explication of those qualities of bodies; and I fear the weakness of human understanding is scarcely able to substitute another, which will afford us a fuller and clearer discovery of the necessary connection and *coexistence* of the powers which are to be observed united in several sorts of them. This at least is certain that whichever hypothesis is clearest and truest (for of that it is not my business to determine), our knowledge concerning corporeal substances will be very little advanced by any of them, until we are made to see what qualities and powers of bodies have a *necessary connection or repugnance* one with another—which in the present state of philosophy, I think, we know but to a very small degree. And I doubt whether, with those faculties we have, we shall ever be able to carry our general knowledge (I say not particular experience) in this part much further. Experience is that which in this part we must depend on. And it is to be wished that it would be more improved. We find the advantages some men's generous pains have this way brought to the stock of natural knowledge. And if others, especially the philosophers by fire, who pretend to it, had been so wary in their observations, and sincere in their reports, as those who call themselves philosophers ought to have been, our acquaintance with the bodies here about us, and our insight into their powers and operations, had been yet much greater.

17. *Of the spirits yet narrower.* If we are at a loss in respect of the powers and operations of bodies, I think it is easy to conclude, *we are much more in the dark in reference to spirits;* of which we naturally have no *ideas*, but what we draw from that of our own, by reflecting on the operations of our own souls within us, as far as they can come within our observation. But how inconsiderable a rank the spirits that inhabit our bodies hold among those various and possibly innumerable kinds of nobler beings, and how far short they come of the endowments and perfections of cherubims and seraphims, and infinite sorts of spirits above us, is what by a transient hint, in another place, I have offered to my reader's consideration.

18. *Thirdly, of other relations, it is not easy to say how far. Morality capable of demonstration.* As to the third sort of our knowledge, namely, the *agreement or disagreement of any of our* ideas *in any other relation*, this, as it is the largest field of our knowledge, so it is hard to determine how far it may extend. Because the advances that are made in this part of knowledge, depending on our sagacity in finding intermediate *ideas* that may show the *relations* and *habitudes* of *ideas*, whose coexistence is not considered, it is a hard matter to tell when we are at an end of such discoveries, and when reason has all the helps it is capable of, for the finding of proofs, or examining the agreement or disagreement of remote *ideas*. They who are ignorant of *algebra* cannot imagine the wonders in this kind are to be done by it. And what further improvements and helps, advantageous to other parts of knowledge, the sagacious mind of man may yet find out, it is not easy to determine. This at least I believe that the *ideas* of quantity are not those alone that are capable of demonstration and knowledge, and that other, and perhaps more useful parts of contemplation, would afford us certainty, if vices, passions, and domineering interest did not oppose or menace such endeavors.

The *idea* of a supreme being, infinite in power, goodness, and wisdom, whose workmanship we are, and on whom we depend, and the *idea* of our selves, as understanding rational creatures, being such as are clear in us, would, I suppose, if duly considered and pursued, afford such foundations of our duty and rules of action as might place *morality among the sciences capable of demonstration;* in which I do not doubt but from self-evident propositions, by necessary consequences, as incontestable as those in mathematics,

the measures of right and wrong might be made out to anyone who will apply himself with the same indifference and attention to the one as he does to the other of these sciences. The *relation* of other *modes* may certainly be perceived, as well as those of number and extension. And I cannot see why they should not also be capable of demonstration, if due methods were thought on to examine or pursue their agreement or disagreement. "*Where there is no property, there is no injustice*," is a proposition as certain as any demonstration in *Euclid*. For the *idea* of *property* being a right to anything, and the *idea* to which the name *injustice* is given being the invasion or violation of that right, it is evident that these *ideas*, being thus established, and these names annexed to them, I can as certainly know this proposition to be true as that a triangle has three angles equal to two right ones. Again, "*No government allows absolute liberty*." The *idea* of government being the establishment of society upon certain rules or laws which require conformity to them, and the *idea* of absolute liberty being for anyone to do whatever he pleases, I am as capable of being certain of the truth of this proposition as of any in the mathematics.

19. *Two things have made moral ideas thought incapable of demonstration. Their complexity and want of sensible representations.* That which in this respect has given the advantage to the *ideas* of quantity, and made them thought more capable of certainty and demonstration is,

First that they can be set down and represented by sensible marks, which have a greater and nearer correspondence with them than any words or sounds whatsoever. Diagrams drawn on paper are copies of the *ideas* in the mind, and not liable to the uncertainty that words carry in their signification. An angle, circle, or square, drawn in lines, lies open to the view, and cannot be mistaken. It remains unchangeable, and may at leisure be considered and examined, and the demonstration be revised, and all the parts of it may be gone over more than once without any danger of the least change in the *ideas*. This cannot be thus done in *moral ideas;* we have no sensible marks that resemble them by which we can set them down; we have nothing but words to express them by, which though, when written, they remain the same, yet the *ideas* they stand for may change in the same man; and it is very seldom that they are not different in different persons.

Secondly, another thing that makes the greater difficulty in *ethics* is that *moral ideas* are commonly more complex than those of the figures ordinarily considered in mathematics. From this these two inconveniences follow: *first*, that their names are of more uncertain signification, the precise collection of simple *ideas* they stand for not being so easily agreed on, and so the sign that is used for them in communication always, and in thinking often, does not steadily carry with it the same *idea*, upon which the same disorder, confusion, and error follow, as would if a man, going to demonstrate something of an heptagon, should, in the diagram he took to do it, leave out one of the angles, or by oversight make the figure with one angle more than the name ordinarily imported, or he intended it should, when at first he thought of his demonstration. This often happens, and is hardly avoidable in very complex moral *ideas*, where the same name being retained, one angle, i.e., one simple *idea*, is left out or put in the complex one (still called by the same name) more at one time than another. *Secondly*, from the complexity of these moral *ideas* there follows another inconvenience, namely, that the mind cannot easily retain those precise combinations so exactly and perfectly as is necessary in the examination of the habitudes and correspondences, agreements or disagreements, of several of them one with another, especially where it is to be judged of by long deductions and the intervention of several other complex *ideas*, to show the agreement or disagreement of two remote ones.

The great help against this which mathematicians find in diagrams and figures, which remain unalterable in their drafts, is very apparent, and the memory would often have great difficulty otherwise to retain them so exactly, while the mind went over the parts of them step by step, to examine their several correspondences. And though in casting up a long sum either in addition, multiplication, or division, every part is only a progression of the mind, taking a view of its own *ideas*, and considering their agreement or

disagreement; and the resolution of the question is nothing but the result of the whole, made up of such particulars, of which the mind has a clear perception. Yet without setting down the several parts by marks, whose precise significations are known, and by marks that last and remain in view when the memory had let them go, it would be almost impossible to carry so many different *ideas* in the mind, without confounding or letting slip some parts of the reckoning, and thereby making all our reasonings about it useless. In which case, the ciphers or marks help not the mind at all to perceive the agreement of any two or more numbers, their equalities or proportions; that the mind has only by intuition of its own *ideas* of the numbers themselves. But the numerical characters are helps to the memory, to record and retain the several *ideas* about which the demonstration is made, by which a man may know how far his intuitive knowledge, in surveying several of the particulars, has proceeded; that so he may without confusion go on to what is yet unknown, and at last have in one view before him the result of all his perceptions and reasonings.

20. *Remedies of those difficulties*. One part of *these disadvantages* in moral *ideas*, which has made them be thought not capable of demonstration, may in a good measure be *remedied* by definitions, setting down that collection of simple *ideas*, which every term shall stand for, and then using the terms steadily and constantly for that precise collection. And what methods algebra, or something of that kind, may hereafter suggest to remove the other difficulties, it is not easy to foretell. Confident I am that if men would, in the same method and with the same indifference, search after moral as they do mathematical truths, they would find them have a stronger connection one with another, and a more necessary consequence from our clear and distinct *ideas*, and to come nearer perfect demonstration than is commonly imagined. [. . .]

21. *Fourthly, of real existence, we have an intuitive knowledge of our own, demonstrative of God's, sensible of some few other things*. As to the fourth sort of our knowledge, namely, *of* the *real actual existence* of things, we have an intuitive knowledge of our own *existence;* and a demonstrative knowledge of the *existence* of a God; of the *existence* of anything else, we have no other but a sensitive knowledge, which does not extend beyond the objects present to our senses.

22. *Our ignorance great*. Our knowledge being so narrow, as I have showed, it will perhaps give us some light into the present state of our minds, if we look a little into the dark side and take a view of *our ignorance*, which, being infinitely larger than our knowledge, may serve much to the quieting of disputes and improvement of useful knowledge. If discovering how far we have clear and distinct *ideas*, we confine our thoughts within the contemplation of those things that are within the reach of our understandings, and do not launch out into that abyss of darkness (where we do not have eyes to see, nor faculties to perceive anything) out of a presumption that nothing is beyond our comprehension, we need not go far to be satisfied of the folly of such a conceit. He who knows anything knows this in the first place that he does not need to seek long for instances of his ignorance. The meanest and most obvious things that come in our way have dark sides that the quickest sight cannot penetrate into. The clearest and most enlarged understandings of thinking men find themselves puzzled, and at a loss, in every particle of matter. We shall the less wonder to find it so, when we consider the *causes of our ignorance*, which, from what has been said, I suppose, will be found to be these three:

First, want of *ideas*.

Secondly, want of a discoverable connection between the *ideas* we have.

Thirdly, want of tracing and examining our *ideas*.

23. *First, one cause of it, want of* ideas, *either such as we have no conception of, or such as particularly we have not*. First, there are some things, and those not a few that we are ignorant of, for *want of ideas*.

First, all the simple *ideas* we have are confined (as I have shown) to those we receive from corporeal objects by sensation, and from the operations of our own minds as the objects of reflection. But how much these few and narrow inlets are disproportionate to the vast whole extent of all beings will not be hard to persuade those who are not so foolish as to think their span the measure of all things.

What other simple *ideas* it is possible the creatures in other parts of the universe may have, by the assistance of senses and faculties more, or more perfect, than we have, or different from ours, it is not for us to determine. But to say, or think there are no such, because we conceive nothing of them, is no better an argument than if a blind man should be positive in it that there was no such thing as sight and colors, because he had no manner of *idea* of any such thing, nor could by any means frame to himself any notions about seeing. [. . .]

24. *Because of their remoteness. Secondly*, another great cause of ignorance is the *want of* ideas *we are capable of*. As the want of *ideas* which our faculties are not able to give us shuts us wholly from those views of things, which it is reasonable to think other beings more perfect than we have, of which we know nothing, so the want of *ideas* I now speak of keeps us in ignorance of things we conceive capable of being known to us. *Bulk*, *figure*, and *motion* we have *ideas* of. But though we are not without *ideas* of these primary qualities of bodies in general, yet not knowing what is the particular *bulk*, *figure*, and *motion* of the greatest part of the bodies of the universe, we are ignorant of the several powers, efficacies, and ways of operation, by which the effects, which we daily see, are produced. These are hidden from us, in some things by being *too remote*, *and* in others by being too *minute*. When we consider the vast distance of the known and visible parts of the world, and the reasons we have to think that what lies within our ken is but a small part of the universe, we shall then discover a huge abyss of ignorance. What are the particular fabrics of the great masses of matter which make up the whole stupendous frame of corporeal beings, how far they are extended, what is their motion, and how continued or communicated, and what influence they have one upon another, are contemplations that, at first glimpse, our thoughts lose themselves in. If we narrow our contemplations and confine our thoughts to this little canton, I mean this system of our sun, and the grosser masses of matter that visibly move about it, what several sorts of vegetables, animals, and intellectual corporeal beings, infinitely different from those of our little spot of earth, may there probably be in the other planets, to the knowledge of which, even of their outward figures and parts, we can no way attain, while we are confined to this earth, there being no natural means, either by sensation or reflection, to convey their certain *ideas* into our minds? They are out of the reach of those inlets of all our knowledge. And what sorts of furniture and inhabitants those mansions contain in them, we cannot so much as guess, much less have clear and distinct *ideas* of them.

25. *Because of their minuteness*. If a great, no, far the greatest part of the several ranks of *bodies* in the universe escape our notice by their remoteness, there are others that are no less concealed from us by their *minuteness*. These insensible corpuscles being the active parts of matter, and the great instruments of nature, on which depend not only all their secondary qualities, but also most of their natural operations, our want of precise distinct *ideas* of their primary qualities keeps us in an incurable ignorance of what we desire to know about them. I do not doubt but if we could discover the figure, size, texture, and motion of the minute constituent parts of any two bodies, we should know without trial several of their operations one upon another, as we do now the properties of a square or a triangle. Did we know the mechanical affections of the particles of *rhubarb*, *hemlock*, *opium*, and a *man*; as a watchmaker does those of a watch, by which it performs its operations, and of a file which by rubbing on them will alter the figure of any of the wheels, we should be able to tell beforehand that *rhubarb* will purge, *hemlock* kill, and *opium* make a man sleep, as well as a watchmaker can, that a little piece of paper laid on the balance will keep the watch from going until it is removed, or that, some small part of it being rubbed by a file, the machine would quite lose its motion, and the watch go no more. The dissolving of silver in *aqua fortis*, and gold in *aqua regia*, and not *vice versa*, would be then perhaps no more difficult to know than it is to a smith to understand why the turning of one key will open a lock, and not the turning of another. But while we are destitute of senses acute enough to discover the minute particles of bodies and to give us *ideas* of their mechanical affections, we must be content to be ignorant of their

properties and ways of operation; nor can we be assured about them any further than some few trials we make are able to reach. But whether they will succeed again another time we cannot be certain. This hinders our certain knowledge of universal truths concerning natural bodies; and our reason carries us here very little beyond particular matter of fact.

26. *Hence no science of bodies.* And therefore I am apt to doubt that, however far human industry may advance useful and *experimental* philosophy *in physical things*, *scientific* will still be out of our reach, because we want perfect and adequate *ideas* of those very bodies which are nearest to us, and most under our command. Those which we have ranked into classes under names, and we think ourselves best acquainted with, we have but very imperfect and incomplete *ideas* of. Distinct *ideas* of the several sorts of bodies that fall under the examination of our senses perhaps we may have. But adequate *ideas*, I suspect, we do not have of anyone among them. And though the former of these will serve us for common use and discourse, yet while we want the latter, we are not capable of *scientific knowledge*; nor shall ever be able to discover general, instructive, unquestionable truths concerning them. *Certainty* and *demonstration* are things we must not, in these matters, pretend to. By the color, figure, taste, and smell, and other sensible qualities, we have as clear and distinct *ideas* of sage and hemlock as we have of a circle and a triangle. But having no *ideas* of the particular primary qualities of the minute parts of either of these plants, nor of other bodies which we would apply them to, we cannot tell what effects they will produce; nor when we see those effects, can we so much as guess, much less know, their manner of production. [. . .]

28. *Secondly, want of a discoverable connection between* ideas *we have.* *Secondly*, what a small part of the substantial beings that are in the universe, the want of *ideas* leaves open to our knowledge, we have seen. In the next place, another cause of ignorance, of no less moment, is a want of a *discoverable connection* between those *ideas* we have. For wherever we want that, we are utterly incapable of universal and certain knowledge, and are, in the former case, left only to observation and experiment, which, how narrow and confined it is, how far from general knowledge, we need not be told. I shall give some few instances of this cause of our ignorance, and so leave it. It is evident that the bulk, figure, and motion of several bodies about us produce in us several sensations, as of colors, sounds, tastes, smells, pleasure and pain, etc. These mechanical affections of bodies having no affinity at all with those *ideas* they produce in us (there being no conceivable connection between any impulse of any sort of body and any perception of a color or smell, which we find in our minds), we can have no distinct knowledge of such operations beyond our experience, and can reason no otherwise about them than as effects produced by the appointment of an infinitely wise agent, which perfectly surpass our comprehensions. As the *ideas* of sensible secondary qualities which we have in our minds can by us be no way deduced from bodily causes, nor any correspondence or connection be found between them and those primary qualities which (experience shows us) produce them in us, so on the other side, the operation of our minds upon our bodies is as inconceivable. How any thought should produce a motion in body is as remote from the nature of our *ideas* as how any body should produce any thought in the mind; that it is so, if experience did not convince us, the consideration of the things themselves would never be able in the least to discover to us. These, and the like, though they have a constant and regular connection, in the ordinary course of things, yet that connection being not discoverable in the *ideas* themselves, which appearing to have no necessary dependence one on another, we can attribute their connection to nothing else but the arbitrary determination of that all-wise agent who has made them to be and to operate as they do, in a way wholly above our weak understandings to conceive.

29. *Instances.* In some of our *ideas* there are certain relations, habitudes, and connections, so visibly included in the nature of the *ideas* themselves that we cannot conceive them separable from them by any power whatsoever. And in these only we are capable of certain and universal knowledge. Thus the *idea* of a right-lined triangle necessarily carries with it an equality of its angles to two right ones. Nor can

we conceive this relation, this connection of these two *ideas*, to be possibly mutable, or to depend on any arbitrary power, which of choice made it thus, or could make it otherwise. But the coherence and continuity of the parts of matter, the production of sensation in us of colors and sounds, etc., by impulse and motion—no, the original rules and communication of motion being such that we can discover no natural connection with any *ideas* we have in them—we cannot but ascribe them to the arbitrary will and good pleasure of the wise architect. I need not, I think, here mention the resurrection of the dead, the future state of this globe of earth, and such other things, which are by everyone acknowledged to depend wholly on the determination of a free agent. The things that, as far as our observation reaches, we constantly find to proceed regularly, we may conclude do act by a law set them, but yet by a law that we know not. Though causes work steadily in this, and effects constantly flow from them, yet their *connections* and *dependencies* being not discoverable in our *ideas*, we can have but an experimental knowledge of them. From all this it is easy to perceive what a darkness we are involved in, how little it is of being, and the things that are that we are capable to know. And therefore we shall do no injury to our knowledge when we modestly think with ourselves that we are so far from being able to comprehend the whole nature of the universe, and all the things contained in it, that we are not capable of a philosophical knowledge of the bodies that are about us, and make a part of us. Concerning their secondary qualities, powers, and operations, we can have no universal certainty. Several effects come every day within the notice of our senses, of which we have so far *sensitive knowledge*; but the causes, manner, and certainty of their production, for the two foregoing reasons, we must be content to be very ignorant of. In these we can go no further than particular experience informs us of matter of fact, and by analogy to guess what effects the like bodies are, upon other trials, like to produce. But as to a perfect *science* of natural bodies (not to mention spiritual beings) we are, I think, so far from being capable of any such thing that I conclude it lost labor to seek after it.

30. *Thirdly, want of tracing our* ideas. Thirdly, where we have adequate *ideas*, and where there is a certain and discoverable connection between them, yet we are often ignorant, for want of *tracing* those *ideas* which we have, or may have, and for want of finding out those intermediate *ideas*, which may show us what habitude of agreement or disagreement they have one with another. And thus many are ignorant of mathematical truths, not out of any imperfection of their faculties, or uncertainty in the things themselves, but for lack of application in acquiring, examining, and by due ways comparing those *ideas*; that which has most contributed to hinder the due *tracing* of our *ideas*, and finding out their relations, and agreements or disagreements one with another, has been, I suppose, the ill use of *words*. It is impossible that men should ever truly seek or certainly discover the agreement or disagreement of *ideas* themselves, while their thoughts flutter about or stick only in sounds of doubtful and uncertain significations. Mathematicians abstracting their thoughts from names and accustoming themselves to set before their minds the *ideas* themselves that they would consider, and not sounds instead of them, have avoided by these means a great part of that perplexity, puddering, and confusion, which has so much hindered men's progress in other parts of knowledge. For while they stick in words of undetermined and uncertain signification, they are unable to distinguish true from false, certain from probable, consistent from inconsistent, in their own opinions. This having been the fate or misfortune of a great part of men of letters, the increase brought into the stock of real knowledge has been very little, in proportion to the schools, disputes, and writings, the world has been filled with, while students being lost in the great wood of words did not know where they were, how far their discoveries were advanced, or what was wanting in their own or the general stock of knowledge. Had men, in the discoveries of the material, done as they have in those of the intellectual world, [that is,] involved all in the obscurity of uncertain and doubtful ways of talking, [then] volumes written of navigation and voyages, theories and stories of zones and tides, multiplied and disputed, no, ships built, and fleets sent out,

would never have taught us the way beyond the line, and the Antipodes would be still as much unknown as when it was declared heresy to hold there were any. But having spoken sufficiently of words and the ill or careless use that is commonly made of them, I shall not say anything more of it here.

31. *Extent in respect of universality*. Up to now we have examined the *extent* of our knowledge in respect of the several sorts of beings that are. There is another *extent of it in respect of universality*, which will also deserve to be considered; and in this regard, our knowledge follows the nature of our *ideas*. If the *ideas* are abstract, whose agreement or disagreement we perceive, our knowledge is universal. For what is known of such general *ideas* will be true of every particular thing in whom that essence, i.e., that abstract *idea* is to be found, and what is once known of such *ideas* will be perpetually and forever true, so that as to all general knowledge we must search and find it only in our minds, and it is only the examining of our own *ideas* that furnishes us with that. Truths belonging to essences of things (that is, to abstract *ideas*) are eternal and are to be found out by the contemplation only of those essences, as the existence of things is to be known only from experience. But having more to say of this in the chapters where I shall speak of general and real knowledge, this may here suffice as to the universality of our knowledge in general.

Chapter IV. *Of the Reality of Knowledge*.

1. *Objection, knowledge placed in* ideas *may be all bare vision*. I do not doubt but my reader by this time may be apt to think that I have been all this while only building a castle in the air, and be ready to say to me, To what purpose all this stir? Knowledge, you say, is only the perception of the agreement or disagreement of our own *ideas*. But who knows what those *ideas* may be? Is there anything so extravagant as the imaginations of men's brains? Where is the head that has no *chimeras* in it? Or if there is a sober and a wise man, what difference will there be, by your rules, between his knowledge and that of the most extravagant fancy in the world? They both have their *ideas* and perceive their agreement and disagreement one with another. If there is any difference between them, the advantage will be on the warm-headed man's side as having the more *ideas*, and the more lively. And so, by your rules, he will be the more knowing. If it is true that all knowledge lies only in the perception of the agreement or disagreement of our own *ideas*, the visions of an enthusiast and the reasonings of a sober man will be equally certain. It is no matter how things are; so a man observes but the agreement of his own imaginations and talks conformably, it is all truth, all certainty. Such castles in the air will be as strongholds of truth as the demonstrations of *Euclid*. That a harpy is not a centaur is by this way as certain knowledge, and as much a truth, as that a square is not a circle.

But *of what use is all this fine knowledge of men's own imaginations* to a man who inquires after the reality of things? It does not matter what men's fancies are, it is the knowledge of things that is only to be prized. It is this alone gives a value to our reasonings and preference to one man's knowledge over another's that it is of things as they really are, and not of dreams and fancies.

2. *Answer. Not so, where* ideas *agree with things*. To which I answer that if our knowledge of our *ideas* terminate in them, and reach no further, where there is something further intended, our most serious thoughts will be of little more use than the reveries of a crazy brain, and the truths built upon this of no more weight than the discourses of a man who sees things clearly in a dream, and with great assurance utters them. But, I hope, before I have done, to make it evident that this way of certainty, by the knowledge of our own *ideas*, goes a little further than bare imagination. And I believe it will appear that all the certainty of general truths a man has lies in nothing else.

3. It is evident the mind does not know things immediately, but only by the intervention of the *ideas* it has of them. *Our knowledge* therefore is *real*, only so far as there is a conformity between our *ideas* and the reality of things. But what shall be here the criterion? How shall the mind, when it perceives nothing but its own *ideas*, know that they agree with things themselves? This, though it seems not to want difficulty, yet, I think, there are two sorts of *ideas* that, we may be assured, agree with things.