

New Essays on Human Understanding

Book IV: Knowledge

G. W. Leibniz

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[Brackets] enclose editorial explanations. Small ·dots· enclose material that has been added, but can be read as though it were part of the original text. Occasional •bullets, and also indenting of passages that are not quotations, are meant as aids to grasping the structure of a sentence or a thought. Every four-point ellipsis indicates the omission of a brief passage that seems to present more difficulty than it is worth.—Longer omissions are [explained] as they occur. Very small bold unbracketed numerals indicate the corresponding section number in Locke's *Essay*; most of these are provided by Leibniz. This version does not follow Leibniz's practice of always avoiding Locke's name in favour of 'this author', 'our gifted author', etc.

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Chapter xiii: Some further considerations concerning our knowledge

Philaethes: 1 Perhaps I should add that *knowing* resembles *seeing* in several respects, including this: that each of them is neither wholly necessary nor wholly voluntary. A man with his eyes open in the light can't help seeing (·necessary·) but he can turn his eyes in different directions ·thus making a difference to *what* he sees (voluntary·). 2 And he can ·choose to· look more or less intently at the objects he sees. ·And it's like that with *knowing*·. Thus, as long as the faculty ·of knowledge· is employed, we can't voluntarily choose what to know, any more than a man can prevent himself from seeing what he does see. 3 But one must ·choose to· employ one's faculties in the right way to be informed.

Theophilus: We discussed this point earlier, and established that a man isn't responsible for having this or that opinion at the present time, but that he is responsible for taking steps to have it or not have it later on [page 78]. So that opinions are voluntary only in an indirect way.

Chapter xiv: Judgment

Philaethes: 1 A man would nearly always find himself *stuck* if he had nothing to guide him except certain knowledge. 2 He must often settle for the twilight of probability. 3 The faculty by which we avail ourselves of probability is *judgment*. Often we settle for judgment because we have no alternative, but often we do it because we are lazy or clumsy or in a rush. It is called 'assent' or 'dissent'

Theophilus: There are people for whom *judging* is what we do whenever we pronounce in accordance with some *knowl-*

edge of the case; and some of them may even distinguish 'judgment' from 'opinion' on the basis that opinions can be more uncertain than judgments can. But I don't want to join issue with anyone over the use of words; and it's all right for you to take a 'judgment' to be a probable belief. . . .

Chapter xv: Probability

Philaethes: 1 If demonstration exhibits the connection of ideas, probability is simply the *appearance* of such connections, resting on proofs [here = 'lines of thought'] in which no logical connection is seen. 2 There are many levels of assent, from •assurance all the way down to •conjecture, •doubt and •distrust. 3 When a conclusion is certain, each step in the reasoning through which it is reached involves intuition. But what makes me believe is something extraneous. 4 And probability is based either on •conformity with something we know or on •the testimony of those who know it.

Theophilus: I would rather maintain that it is always based on •likelihood or on •conformity to truth. The testimony of other people is something else that the truth customarily has on its side when it concerns facts that are within reach. So we can say that the resemblance between the probable and the true comes either from the thing itself or from 'something extraneous'. . . .

Phil: 5 If something is remote from everything we know, it doesn't *resemble the truth* ·so far as we know the truth·, and so we don't find it easy to believe. . . . 6 But if the *testimony* of others can make a fact probable, the *opinion* of others shouldn't count by itself as a legitimate basis for probability, since there is more error than knowledge amongst men. If the beliefs of people whom we know and think well of were a legitimate ground of assent, men would have reason to be

heathens in Japan, Moslems in Turkey, Papists in Spain, Calvinists in Holland, and Lutherans in Sweden.

Theo: Men's testimony doubtless carries more weight than their opinions do, and we give it greater consideration in the courts. However, we know that judges sometimes require a witness to take an 'oath of credulity', as it is called; during an examination witnesses are often asked not only what they •saw but what they •judge and at the same time •the reasons for their judgment; and what they say is duly taken into account. Also, judges show great deference to the views and opinions of experts in every field; private individuals are no less obliged to do the same in matters that they can't investigate for themselves. So a child (or an inexperienced adult, whose position in this respect is hardly better than a child's) is obliged to follow the religion of his country so long as he sees nothing wrong with it and isn't in a position to inquire into whether there is a better one.

Chapter xvi: The degrees of assent

Philaethes: 1 Our judgments about what is probable are based purely on what degree of likelihood we •find in the relevant considerations. Or •*did* find when we looked into them: for it must be admitted that my assent ·at a particular time· can't be always from what I see ·at that time· of the reasons that have prevailed on my mind. It would be very hard, even for people with admirable memories, always to retain all the lines of thought that made them embrace that side of the question—lines of thought that are in some cases enough to fill a volume on one single question. All that is needed ·to entitle them to assent *now* is that they *did once* carefully and fairly sift the matter and come to a conclusion. 2 Otherwise men would have either to •be outright sceptics or else to

•change their opinions every moment, giving in to whomever has recently studied the question and offers them arguments that they can't completely rebut right away—because they haven't time or haven't the memory resources for that. 3 It must be admitted that this often makes men obstinate in error. But the source of the trouble is not •their reliance on their memories but rather •their judging badly in the first place. For often the reflection 'I never thought otherwise' serves a man as a substitute for investigation and reason! In fact, those who have least examined their opinions are usually the firmest in holding to them. It is commendable to hold to what we have •seen, but not always to what we have •believed, since we may have overlooked something that could overturn it all. There may be no-one in the world who has the leisure, patience and means to •collect together all the arguments on each side of the questions on which he has opinions, and to •compare these lines of thought so as *safely* to conclude that he knows all he needs to know. However, the conduct of our lives and the management of our great concerns won't let us delay; and in matters on which we aren't capable of certain knowledge it is absolutely necessary for us to make judgments.

Theophilus: Those remarks are thoroughly sound and good. In certain cases, though, one could wish that men *did* keep written summaries of the reasons that have led them to some important view that they will often have to justify later on, to themselves or others. Let me add that although it isn't usually permitted in the courts to rescind a judgment after it has been delivered, or to do a revision after having 'come to a conclusion' (otherwise we would have to be in perpetual disquiet, which would be all the more intolerable because we can't always keep records of past events), nevertheless we are sometimes allowed to appeal to the courts on new

evidence It's like that also in our personal affairs and especially in the most important matters, in cases where it is still open to us to plunge in or to draw back, and isn't harmful to •postpone action or to •edge ahead *cautiously*: the pronouncements that our minds make on the basis of probabilities should never be taken as so settled that we shan't ever be willing to revise our reasoning in the light of substantial new reasons going the other way. But when there is no time left for thinking things over we must abide by the judgment we have made as resolutely—though not always as inflexibly—as if it were infallible.

Phil: 4 So men can't avoid risking error when they judge, or avoid having differing opinions when they can't see matters from the same point of view; and therefore they ought to maintain peace and decent civility throughout their differences of belief, and not expect anyone to give up a deep-rooted opinion just because we object to it—especially if he has reason to suspect us, his opponents, of self-interest or ambition or some other personal motive. Those who want to force others to yield to their opinions usually turn out not to have examined things at all well. Nothing violent is to be expected from people who have explored an issue deeply enough to be past any legitimate basis for doubt: *they* don't find much reason to condemn others, and anyway there are very few of them.

Theo: Really, what we are most justified in criticizing is not •men's opinions but •their immoderate condemnation of the opinions of others—as if only a fool or a knave could judge otherwise than they do! This attitude on the part of those who stir up these passions and hatreds among the people results from a haughty and biased mind that loves to dominate and can't bear to be contradicted. Not that there isn't often good reason to criticize the opinions of others;

but this should be done fair-mindedly and with compassion for human frailty. We certainly have the right to protect ourselves against •evil doctrines that influence morality and pious observances, but we shouldn't malign people by ascribing •these to them without good evidence. Impartiality recommends mercy, but piety commands that when people's dogmas are harmful their bad effects be pointed out where it is appropriate to do so: for example, beliefs that go against the providence of a perfectly good, wise and just God, or against the immortality of souls that lays them open to the operations of his justice; not to mention other opinions that are dangerous to morality and public order. I know that some excellent and well-meaning people maintain that these theoretical opinions have less practical effect than is generally thought. I know too that there are people with fine characters who would never be induced by *doctrines* to do anything unworthy of themselves; moreover, those who reach these erroneous opinions in the course of theorizing are not only naturally inclined to be above the vices to which ordinary men are prone but also are concerned for the good name of the sect of which they are in effect the leaders. One can acknowledge that Epicurus and Spinoza, for instance, led exemplary lives. But these considerations usually fail to apply to their disciples and imitators; believing themselves to be relieved of the deterrent fear of a God who sees what they do and of a future •after-life• that threatens them, they let loose their animal passions and apply their thoughts to seducing and corrupting others. If they are ambitious and naturally rather callous they are capable of setting fire to the four corners of the earth for their pleasure or advancement—I *knew* men of this sort (they are dead now [Leibniz was nearly 60 when he wrote this]). I even find that somewhat similar opinions •steal gradually into the minds of men in high positions who rule the rest and on whom public affairs depend, and

•slither into fashionable books, and are in this way •tilting everything towards the universal revolution with which Europe is threatened, and are •completing the destruction of what still remains in the world of the generous sentiments of the ancient Greeks and Romans. *They* placed love of country and of the public good, and the welfare of future generations, before fortune and even before life. This ‘public spirit’, as the English call it, is dwindling away and is no longer in fashion; it will die away all the more when it ceases being sustained by the good morality and true religion that natural reason itself teaches us. Among those of the contrary character, which is beginning to prevail, the best have no other principle but what *they* call ‘honour’. But for them the mark of an honest man or a man of ‘honour’ is merely that he won’t do anything that *they* consider base. . . . But let me get back to my main point In theology criticism is carried even further than in other areas. Those who prize their orthodoxy often condemn their adversaries; and are in turn opposed, even within their own sect, by those who are trying to bring the sects together. The result of this opposition is civil war between the •rigid and the •yielding within a single sect. But it’s an encroachment on God’s prerogative to deny eternal salvation to those who hold different opinions; so the wisest of the condemners confine themselves to the peril in which, in their view, these erring souls stand; they leave to the special mercy of God those who aren’t so wicked that they can’t profit from it, and they believe themselves obliged to make every imaginable effort to remove these people from their dangerous position. If these people who think in *this* way about the peril of others have reached their opinion after an appropriate investigation, and if there is no way of undeceiving them, we can’t find fault with their conduct as long as they are gentle in how they treat others. But as soon as they go beyond this they violate the laws of impartiality.

For they should bear in mind that other people, who are just as convinced as they are, have just as much right to maintain their own views and even to propagate them if they think them important. An exception ·to all this· should be made of opinions that advocate crimes that oughtn’t to be tolerated; we have the right to stamp these out by stern measures—even if the person who holds them can’t shake himself free of them—just as we have the right to destroy a venomous beast, innocent as it is. But I’m speaking of stamping out the sect, not the men, since we can prevent them from doing harm and from preaching their dogmas.

Phil: 5 Let’s return to our topic of the grounds of assent and the degrees of assent—i.e. the different levels of confidence with which one may assent to a proposition·. We should notice that propositions are of two sorts: those of •matter of fact, which concern matters that can be empirically observed and therefore can be accepted on the strength of human testimony; and those of •speculation [here = ‘abstract theorizing’], which aren’t supportable by such testimony because they concern things that our senses can’t reveal to us. **6** When a particular fact is consistent with what we regularly observe and others regularly report, we rely on it as firmly as if it were certain knowledge. And when it conforms with the testimony of all men at all times as far as we can tell, this is the first and highest degree of probability. For example, that fire warms, that iron sinks in water [Locke wrote ‘fire warmed’ and ‘iron sank’.] With that kind of basis for it, our belief rises to *assurance*. **7** Secondly, the historians all report that so-and-so preferred his private advantage to the public interest. Since it has always been observed that this is the practice of most men, the assent that I give to these histories is a case of *confidence*. **8** Thirdly, when there is nothing in the nature of things for or against a factual claim, and it is vouched for

by the testimony of people who aren't suspect—for instance, that Julius Caesar lived—it is accepted with *confident belief*.
 9 But when testimonies clash with the ordinary course of nature or with one another, the degrees of probability can infinitely vary. Hence arise the degrees that we call 'belief', 'conjecture', 'doubt', 'wavering', 'distrust'. In contexts like these we need to be *exact*, so as to form a right judgment and proportion our assent to the degree of probability.

Theo: [Throughout these pages 'proof' means something like 'rational grounds for belief' or 'chain of evidence'. Even a 'complete proof' is nothing like as strong as a *demonstration*.] When legal theorists discuss proofs, presumptions, conjectures, and evidence, they have a great many good things to say on the subject and go into considerable detail. They begin with (1) *common knowledge*, where there is no need for proof. They deal next with (2) *complete proofs*, or what pass for them: judgments are delivered on the strength of these, at least in civil actions. In some jurisdictions they are more cautious in criminal actions; in these there is nothing wrong with insisting on (3) *more-than-full proofs*, and above all for the so-called *corpus delicti* [= 'the body of the person who has been killed'] if it is that sort of case. . . . Then there are (4) *presumptions*, which are accepted provisionally as complete proofs—that is, for as long as the contrary is not proved. There are (5) proofs that are strictly speaking more than half full; a person who founds his case on such a proof is allowed to take an oath to make up its deficiency. And there are others that are (6) less than half full; with these, on the contrary, the oath is administered to the one who denies the charge, to clear him. Apart from these, there are many degrees of conjecture and of evidence. And in criminal proceedings in particular there is evidence sufficient for •applying torture (which itself has varying degrees—i.e. can be more or less severe—depending on what the charge

is); there is evidence sufficient for •displaying the instruments of torture and making preparations as though one intended to use them. There is evidence for •arresting the suspect, and for •gathering evidence surreptitiously. The differences amongst these are also serviceable in other analogous situations. The entire form of judicial procedures is, in fact, nothing but a kind of logic that is applied to legal questions and can be applied elsewhere. We see that physicians also recognize many differences of degree among their signs and symptoms. Mathematicians have begun, in our own day, to calculate the chances in games. It was the Chevalier de Méré—a man of acute mind, a gambler and philosopher—. . . who prompted them by raising questions about the division of the stakes, wanting to know how much a given player's part in a game would be worth if the game were interrupted at such and such a point. Accordingly he enlisted his friend Pascal to take a brief look at the problem. The question caused a stir and prompted Huygens to write his treatise on chance. Other learned men joined in. Certain principles were established, and were also employed by the Dutch leader De Witt in a little Dutch-language discourse on annuities—a topic that brings in •probabilities because the cost at a given time of a lifetime annuity for someone depends on how long that person will •probably live. The foundation they built on involved arriving at an arithmetic mean between several equally admissible hypotheses. Our peasants have used this method for a long time, guided by their natural mathematics. For instance, when some inheritance or piece of land is to be sold, they appoint three teams of assessors . . . each of which assesses the commodity in question. If the first estimates its value at 1000 crowns, the second at 1400 and the third at 1500, they take the total of these three and divide it by three, arriving at 1300 as the mean value sought. . . . This is the axiom that *similar hypotheses must*

receive similar consideration. But when the hypotheses are unlike, we compare them with one another. Suppose, for instance, that with two dice one player will win if he throws a 7 and the other if he throws a 9. We want to know their comparative likelihoods of winning. I say that the second player is only two thirds as likely to win as the first player, since there are three ways for the first to throw a 7 with two dice—1 and 6, or 2 and 5, or 3 and 4—whereas there are only two ways for the second to throw a 9, namely 3 and 6, or 4 and 5. And all these ways are equally possible. So that the likelihoods, which match the numbers of equal possibilities, will be as 3 to 2. I have said more than once [pages 88, 176] that we need a new kind of logic, concerned with degrees of probability, since Aristotle in his *Topics* couldn't have been further from it Anyone wanting to deal with this question would do well to pursue the investigation of *games of chance*. In general, I wish that some able mathematician were interested in producing a detailed study of all kinds of games, carefully reasoned and with full particulars. This would be of great value in improving discovery-techniques, since the human mind appears to better advantage in games than in the most serious pursuits.

Phil: 10 The law of England observes this rule:

A copy of a record is a good proof if it is acknowledged to be authentic by witnesses, but a copy of a copy is not to be admitted as a proof however well attested it is, and however credible the witnesses are.

I have never yet heard of anyone who criticized this wise precaution. It at least carries the message that the further off any •testimony is from the original truth that lies in •the thing itself, the less force it has. In contrast with this, some men think in the opposite way, treating opinions as gaining force by growing older. Something that a thousand years ago

wouldn't have appeared at all probable to any rational man who was a contemporary of •the person who first testified to it is now urged as certain because many people have related it on the strength of •his testimony.

Theo: Scholars in the field of history have great respect for contemporary witnesses to things; though the principal claim to credence, even of a contemporary, is restricted to public events. Still, when he speaks of motives, secrets, hidden machinations, and such uncertain matters as poisonings and assassinations, one does at least learn what various people have believed. [Theophilus continues at considerable anecdotal length about history and some recent historians. In passing, he deplures use of 'the word "Lutheranism", which had common usage has sanctioned in Saxony'.]

Phil: 11 Don't think that my remarks are meant to lessen the credit and usefulness of history. We receive from history a good proportion of the useful truths we have Nothing is more valuable than the records of antiquity, I think. I wish we had more of them, and more uncorrupted. But it remains the case that no copy can rise above the certainty of its first original.

Theo: When we have just one writer of antiquity to attest to some fact, then certainly none of those who have copied what he said have added any weight to it—indeed they should all be entirely disregarded. What they say should be treated exactly as though it had been said only once. . . . Legal scholars have written about historical credibility, but the topic would be worth a more painstaking inquiry, and some of these gentlemen haven't been demanding enough. As for remote antiquity, some of the most resounding 'facts' are dubious. [He gives examples at length. Then:] But when the histories of different nations converge, in situations where it isn't likely that one has been copied from the other, that is

powerful evidence of truth. The agreement in many things between Herodotus and the history of the Old Testament is like that Again, those who are trying to establish the facts get satisfaction from the agreement between •Arabic, Persian and Turkish historians on the one hand and •Greek, Roman and other western ones on the other; as also from the way books that have come down to us from the ancients, and are indeed copies of copies, are attested to by the medals and inscriptions that have survived from ancient times. It remains to be seen what more the history of China will teach us when we are better equipped to make judgments about it so that it comes to have an inherent credibility. History is useful mainly for •the satisfaction one gets from knowing about origins, for •the justice that is done to men who have deserved well of others, for •the establishment of historical scholarship, especially in sacred history which contains the foundations of revelation, and for •the useful lessons we can learn through examples. (There is also the matter of the genealogies and entitlements of princes and powers!) I'm not scornful of the sifting of the materials of antiquity right down to the tiniest trifles, for sometimes the knowledge scholars draw from these can be helpful in more important matters. I'm willing, for instance, that the entire history of clothing and tailoring should be written, from the vestments of the Hebrew priests, or if you like from the coats of skins that God gave to Adam and Eve when they left Paradise, right through to the wigs and flounces of our own times; introducing also whatever can be inferred from ancient sculptures and from paintings several centuries old. . . . But I wish there were people willing to devote themselves to the task of deriving the most useful things from history—such as unusual examples of virtue, remarks about the conveniences of life, and political and military stratagems. And I wish that someone would write a sort of universal history that was explicitly restricted

to things like that and some others of the most significant kind; for sometimes one will read a big history-book, one that is learned, well written, just right for its author's purpose, and excellent of its kind, but containing almost nothing in the way of useful lessons. By that I don't mean simple moralizings but rather skills and items of knowledge that not everyone would think of just when they were needed. I wish further that books of travel were used as a source for endless profitable things of this nature and that they were organized according to their subject matters. But it is astonishing that with so many useful things still to be done men nearly always spend their time on what has been done already, or on what is utterly useless, or anyway on the least important things; and I can see virtually no remedy for this until, in calmer times, society at large takes more of a hand in these matters.

Phil: 12 Let us turn from the probabilities of matters of fact to the probabilities of opinions on matters that don't admit of ·eye-witness· testimony because they don't come within reach of our senses. For example, opinions about •the existence and nature of Spirits, angels, devils and so on; •about what corporeal substances there are in the planets and other parts of the vast universe; and, lastly, •about the inner workings of most of the works of nature. In all these areas we can only conjecture, with probabilities being assigned mainly on the basis of *analogy*. For since these matters can't be attested to, they can appear probable only in proportion as they agree to truths that *are* established. Since rubbing two bodies together violently produces heat and even fire, we judge that fire ·in general· consists in a violent agitation of imperceptible parts; and since the refractions of transparent bodies make colours appear, we judge that colours whose origins we don't see come from a similar kind of refraction.

In all parts of the creation that we can observe we find a gradual connection without any great gaps in between; and this gives us reason to believe that by such gentle steps things ·in general· ascend upwards in degrees of perfection. It's hard to say where exactly the line falls separating things that can *sense* from ones that can't, things that can *think* from ones that can't, and things that are ·*alive* from ones that aren't There's an enormous difference between some men and some brute animals, but there are also some men whose level of understanding and ability differs so little from that of some brutes that we'll find it hard to say that in those respects those men are above those brutes. Well, then, observing such gradual and gentle descents downwards in the parts of the creation that are lower than man, right down to the lowest, the rule of *analogy* leads us to think it probable that the same ·gradualness in differences of level· applies also to things that are above us and out of our observation. This sort of probability is the great foundation of rational hypotheses.

Theo: It is on the basis of this ·kind of reasoning from-analogy that Huygens judges that the other principal planets are in a condition much like our own, except for differences that are bound to arise from their different distances from the sun Until we discover telescopes like those of which Descartes held out hope, which would let us pick out on the lunar surface things no bigger than our houses, we shan't be able to settle what there is on any globe other than ours. Our conjectures about the inner parts of terrestrial bodies will be more useful and more open to confirmation: I hope that on many matters we shall get beyond mere conjecture; and I believe that at least the violent agitation of the parts of fire, which you mentioned a moment ago, shouldn't be counted amongst the merely probable things. It is a pity

that Descartes's hypothesis about the structure of the parts of the visible universe has had so little confirmation from subsequent research and discovery, or that Descartes didn't live fifty years later so that he could give us as ingenious an hypothesis for our present knowledge as he gave for what was known in his time. As for the gradual connection of species: we have already had something to say about that in a previous discussion, when I commented that philosophers have in the past reasoned about a vacuum among forms or among species [see page 142]. In nature everything happens by degrees, nothing by jumps; and this rule about change is one part of my law of continuity. But the beauty of nature, which insists on perceptions that stand out from one another, asks for the appearance of jumps and for musical cadences (so to speak) amongst phenomena, and takes pleasure in mingling species. Thus, although in some other world there may be species intermediate between man and beast (depending on what senses the words 'man' and 'beast' are taken in), and although in all likelihood there are *somewhere* rational animals that surpass us, nature has seen fit to keep these at a distance from us so that there will be no challenge to our superiority on our own globe. I speak of intermediate *species*, and I wouldn't want to handle this matter in terms of human individuals who resemble brutes, because ·they are probably members of the same species as the rest of us·: it is likely that what they suffer from is not a •lack of the faculty of reason but •some blockage that prevents it from being exercised. So I believe that the stupidest man (if he is not in a condition that is contrary to nature, through illness or some other permanent defect that works like an illness) is incomparably more rational and teachable than the most intellectual of all the beasts; although the opposite is sometimes said as a joke. I would add that I strongly favour inquiry into analogies: more and more of them are going to

be yielded by plants, insects and the comparative anatomy of animals, especially as the microscope continues to be used more than it has been. And in regard to more general matters, my views about monads will be found manifested everywhere—views about

- their endless duration,
- the preservation of the animal along with the soul,
- the occurrence of confused perceptions in a certain state such as that of death in simple animals,
- the bodies that can reasonably be attributed to Spirits, and
- the harmony between souls and bodies, such that each perfectly follows its own laws without being disturbed by the other and with no need for a distinction between voluntary and involuntary.

It will be found, I claim, that •all these views are in complete conformity with the analogies amongst things that come to our notice; that •all I'm doing is to apply my views beyond our observations, not restricting them to certain portions of matter or to certain kinds of action; and that •the only difference between what we observe and what we don't is that between large and small, between sensible and insensible.

Phil: 13 Nevertheless, there is one case where we give weight not so much to •the analogy with natural things that we have encountered in experience as to •the contrary testimony of a strange fact that is remote from our experience. For where supernatural events are suitable to the ends of •God who has the power to change the course of nature, we have no grounds for refusing to believe them when they are well attested. This is the case of miracles **14** Finally, there is a testimony that is superior to every other kind of assent. It is *revelation*, the testimony of God, who can neither deceive nor be deceived; and our assent to it is called *faith*,

which excludes all wavering as completely as the most certain knowledge does. But it is important to be sure that it is a divine revelation and that we have understood it correctly; otherwise we'll be exposed to fanaticism and to the errors of a wrong interpretation. If in a given case it is only *probable* that it was a revelation and only *probable* that it means such-and-such, our level of assent to such-and-such can't be higher than is warranted by those two probabilities. But we'll say more about this later on.

Theo: The theologians distinguish •rational grounds for belief, along with the natural assent that can arise only from such grounds and that can't have a higher probability than they have, from •the supernatural assent that is brought about by divine grace. Whole books have been devoted to the analysis of faith: they somewhat disagree amongst themselves, but since we are going to treat of the topic later, I don't want to anticipate now what we shall have to say in the proper place.

Chapter xvii: Reason

Philaethes: 1 Before separately discussing the topic of •faith let us deal with •reason. Sometimes reason is taken for

- true and clear principles,
- as in the statement '*That the whole is bigger than the part is a truth of reason*'; sometimes for
 - deductions from those principles,
 - as in the statement 'He reached the theorem by applying reason to Euclid's premises'; sometimes for
 - the cause, and particularly the final cause,
 - as in the statements 'The reason for the flood was the breaking of the levees' (the efficient cause), 'His reason for con-

fessing to the crime was to get a lighter sentence' (the final cause). But I'm going to be considering reason as

- the faculty that is supposed to distinguish man from the beasts, and in which he obviously much surpasses them,

- as in the statement 'Men are different in kind from beasts because men have reason whereas beasts don't'. **2** We need this faculty both for the enlargement of our knowledge and for regulating our opinion. Properly understood, it consists of two faculties—•sagacity in the finding of intermediate ideas, and •the faculty for drawing conclusions or inferring. **3** We can distinguish four stages in a use of reason: **(1)** discovering a proof; **(2)** ordering it so that the connections it involves may be seen; **(3)** being aware of each of those connections; **(4)** drawing a conclusion. These stages can be observed in mathematical demonstrations. [We are about to encounter something that needs to be explained. Since Kant, the expression *a priori* has meant '[knowable] just by thinking', in contrast with *a posteriori* = '[knowable] only by consulting one's sense-experience'. Leibniz sometimes used it like that, but in Theophilus's next speech *a priori* is used in an older sense in which an *a priori* reason for proposition P is a *reason why P is true* as distinct from a *reason for believing that P is true*. Some occurrences of *a priori* earlier in the work might be taken either way.]

Theophilus: A reason is a known truth whose connection with some less well-known truth leads us to give our assent to the latter. But it is called a reason, especially and par excellence, if it is the cause not only of •our judgment but also of •the truth itself—which makes it what is known as an *a priori* reason. A

cause in the realm of things

corresponds to a

reason in the realm of truths,

which is why causes themselves—and especially final ones—are often called reasons. And, lastly, the faculty that is aware of this connection amongst truths, i.e. the faculty for reasoning, is also called 'reason', and that's the sense in which you are using the word. Now, here on earth this faculty really is exclusive to man alone and doesn't appear in any other animals on earth; for I showed earlier [page 126] that the shadow of reason that can be seen in beasts is merely an expectation of a similar outcome in a case that seems to resemble the past, with no knowledge of whether the same reason obtains. And that is just how men behave too, in cases where they are merely empirics [see note on page 2]. But they rise above the beasts when they see the connections between truths—connections that themselves constitute necessary and universal truths. These connections may be necessary even when all they lead to is an opinion; this happens when after precise inquiries one can demonstrate on which side the greatest probability lies, so far as that can be judged from the given facts; these being cases where there is a demonstration not of •the truth of the matter but of •which side it would be prudent to adopt. . . .

Phil: **4** *Syllogism* is generally thought to be the proper instrument of reason and the most useful way of employing this faculty. I doubt this, because it serves only to show the connection of the proofs in any one instance, and no more; but the mind sees that connection just as easily, and perhaps better, without that aid. [Philalethes develops a three-page attack on syllogisms, which Theophilus counters with a seven-page defence—both omitted from this version.]

Phil: I'm starting to form an entirely different idea of logic from my former one. I took it to be a game for schoolboys, but I now see that, in your conception of it, it involves a sort of universal mathematics. God grant that it may be

developed beyond its present state, to become a 'true help of reason' (adapting a phrase of Hooker's), which would raise men well above their present condition. And reason is a faculty that has all the more need of it, since **9** its extent is quite limited and in many cases it lets us down. This is **(1)** because we often lack the ideas themselves. **10** Also, **(2)** they are often obscure and imperfect; whereas when they are clear and distinct, as in the case of numbers, we meet with none of those inextricable difficulties and fall into no contradictions. **11** **(3)** We are often in difficulty also through lack of intermediate ideas. Algebra is a great instrument and a remarkable proof of human sagacity; and we know that before it was discovered men looked with amazement at many of the demonstrations of ancient mathematicians. **12** **(4)** It also happens that we proceed on false principles, which can engage us in difficulties; and reason, so far from clearing these away, entangles us the more. **13** **(5)** Lastly, words whose meaning is uncertain puzzle the reason.

Theo: I'm not convinced that **(1)** ideas—distinct ideas, that is—are as lacking to us as you believe. As for **(2)** confused ideas or rather images—or 'impressions' if you prefer—such as colours, tastes and so on, resulting from various tiny ideas that are distinct in themselves though we aren't distinctly aware of them: we lack an infinity of these that befit other creatures more than they do ourselves. But the role of these impressions is to provide us with natural inclinations, and to provide a grounding for observations of experience, rather than to furnish materials for reasoning—except when distinct perceptions come with them. So what holds us back is primarily the inadequacy of our knowledge of these distinct ideas concealed within the confused ones; and even when everything is revealed distinctly to our senses or our minds, it sometimes happens that so many things must be taken into

account that their sheer number confuses us. For instance, if we had a thousand cannon-balls heaped up in front of us, and wanted to take in the number and the mathematical properties of this assemblage, it would obviously be a great help to arrange them in patterns, as they do in arsenals, so as to have distinct ideas of them and to fix them in our minds so that we needn't trouble to count them more than once. In the science of numbers themselves, great difficulties arise because so many things have to be taken into account: what we are looking for are short formulae, but we don't always know in a given case whether such a formula is there to be found. For instance, what is simpler in appearance than the notion of a prime number? That is, a whole number divisible only by itself and unity. And yet we are still hunting for an easy, positive criterion by which they can be identified with certainty, without having to try out all the prime divisors less than the square root of the prime in question. There are plenty of criteria that in many cases show without much calculation that a given number *isn't* prime; but we want one that is easy and that shows decisively, for any prime number, that it *is* prime. That is also why algebra is still so imperfect, even though nothing is better known than the ideas it employs, since they merely signify numbers in general; but people still lack the means of extracting the irrational roots of any equation higher than the fourth degree (except in very restricted cases). [He goes into technical detail about this problem.] This difficulty shows that even the clearest and most distinct ideas don't always yield us all that we want and all that could be derived from them. And this leads to the conclusion that algebra falls far short of being *the* art of discovery, since even it needs the assistance of a more general art. Indeed, we can say that generalized algebra or the art of symbols is a marvellous aid, in that it unburdens the imagination. . . . No doubt the ancients had something

of it. Viète gave it wider scope by using general symbols to express not only •the unknown •number that is to be discovered• but also •the numbers that are given •in the setting of the problem—thereby doing in calculation what Euclid had already done in reasoning. And Descartes extended the application of this calculus to geometry by representing lines by equations. [He tells an anecdote about an awe-inspiring mathematical discovery that Archimedes made concerning spirals. Then:] The new infinitesimal calculus . . . which I have discovered and made public with good results provides a general procedure in terms of which this discovery about spirals is mere child's play and the simplest of exercises, like almost everything that had previously been found out about the mensuration of curves. This new calculus is better, also, because it unburdens the imagination in the case of those problems that Descartes excluded from his *Geometry*—because they usually bring in mechanical considerations, *he said*, but really because they didn't suit his method of calculation! As for the errors that arise from (4) ambiguous terms and (5) false principles, it's up to us to avoid them.

Phil: 14 There is also a case where reason can't be applied, but where we also don't need it and where vision is better than reason. This is in *intuitive* knowledge, where the connection of ideas and of truths is immediately seen. Knowledge of indubitable maxims consists in this; and I'm inclined to think that this is the degree of evidentness that angels have now, and that the perfected spirits of good men will have in the after-life of thousands of things that we in this life can't take in. 15 But demonstration based on intermediate ideas yields *rational* knowledge. This is because there is a necessary connection between the intermediate idea and each of the two ideas flanking it—a connection that is seen by laying evident truths side by side, like applying a

yard-stick first to one piece of cloth and then to another, to show that they are equal. 16 But if the connection is only probable, the judgment yields only an opinion.

Theo: Only God has the privilege of having nothing but intuitive knowledge. The souls of the blessed, and Spirits, have knowledge that is incomparably more intuitive than ours; they often see at a glance what we can only discover by using inference and expending time and effort. But the souls of the blessed, however detached they are from gross bodies like ours, must also encounter difficulties in their path; otherwise they wouldn't enjoy the pleasure of discovery, which is one of the greatest pleasures. And the same holds for Spirits, however sublime they are. It must be acknowledged that for both groups there will always be an infinity of truths that are hidden, either entirely or for a while, which they must arrive at through inference and demonstration or even by conjecture in many cases.

Phil: So these Spirits are just animals like ourselves, only more perfect. It is as though you were to say, like •the fictional• Harlequin, the Emperor of the Moon: *It's just like here!* [This comparison isn't Locke's. It was Leibniz who was fond of referring to a popular farce in which Harlequin, 'emperor of the moon', says on earth that how people behave on the moon is 'just like here'.]

Theo: I do say that; not in every respect, since the kinds and levels of perfection vary infinitely, but as regards the foundations of things. *The foundations are everywhere the same*; this for me is a basic maxim that governs my whole philosophy. I conceive •unknown and •confusedly known things always in the manner of •things that are distinctly known to us. This makes philosophy very easy, and I really believe it's how it should be carried on. But if this philosophy is the simplest in resources it is also the richest in kinds of effects, because nature *can* vary these infinitely—and so

it *does*, with the greatest imaginable abundance, order and adornment. This is why I believe that there is no Spirit, however exalted, who doesn't have an infinite number of others superior to him. However, although we are much inferior to so many intelligent beings, we have the privilege of not being visibly over-mastered on this planet, on which we hold unchallenged supremacy; for all the ignorance in which we are plunged, we still have the satisfaction of not *seeing* anything that outdoes us. . . . Of course, I'm speaking here only about the •natural knowledge of these Spirits, and not about the •beatific vision or about the supernatural insights that God chooses to give them.

Phil: 19 Since everyone employs reason either on his own account or in dealing with others, let us think a little about four sorts of arguments that men commonly use •to get others to assent or at least •to awe them into silence. [He gives these arguments Latin names, of which only one is preserved in this version.] **(1)** In argument one may bring forward the opinions of men whose learning, eminence, power or some other cause has gained them authority. For when a man doesn't readily give in to these opinions he is apt to be criticized as being full of vanity, and is even accused of insolence. **20 (2)** Or one may require one's adversary to accept what one is saying or else to come up with something better. **21 (3)** There is *argumentum ad hominem* [Latin = 'argument aimed at the man'], in which things the adversary himself has said are used in one's argument against him. **22 (4)** One may argue using proofs drawn from any of the foundations of knowledge or probability. This is the only one of them all that advances and instructs us. For if **(1)** out of respect I dare not contradict you, or if **(2)** I have nothing better to say, or if **(3)** I contradict myself, it doesn't at all follow that you are right. I may be **(1)** modest, **(2)** ignorant, **(3)** in error, and still you may be in error too.

Theo: We must certainly distinguish what it is good to say from what it is correct to believe; but since most truths can be boldly upheld, **(1)** when an opinion has to be concealed that creates a presumption against it. The kind **(2)** of argument is sound in cases where there is a presumption which makes it reasonable to hold to one opinion until its contrary is proved. What the **(3)** argument *ad hominem* achieves is to show that one or other assertion is false and that one's adversary is mistaken however one takes him. Other arguments that people use could be mentioned, for instance the one that goes like this: 'If this proof is not accepted, we have no way to attain certainty about the matter in question, which is absurd.' This argument is sound in certain cases—for instance, if someone wanted to deny basic immediate truths such as that *nothing can both be and not be at the same time* or that *we ourselves exist*; for if he were right there would be no way of knowing anything whatever. But when someone has devised certain principles, and wants to uphold them on the ground that without them some accepted doctrine would collapse, the argument isn't conclusive. Because we need to distinguish •what is necessary to uphold our knowledge from •what serves as a foundation for our accepted doctrines or practices. Legal scholars have sometimes used a similar line of reasoning in defence of condemning or torturing alleged sorcerers on the testimony of others accused of the same crime. 'If this argument [here = 'source of evidence'] is rejected', they have said, 'how can we convict them?' And some writers maintain that in the criminal cases where it is harder to obtain conviction, weaker evidence can be accepted as adequate. But that is no reason. All that follows is that •we must employ greater care, not that •we ought to believe more readily; except with extremely dangerous crimes—such as high treason, for example—where this consideration *does* carry weight, not in condemning a man but in preventing

him from doing harm. So there can be a middle course, not between •guilt and •innocence, but between •condemnation and •acquittal, where law and custom permit such ·middle-judgments. . . .

Phil: 23 Having said a little about the relation of our reason to other men, let me add something about its relation to God. This requires that we distinguish what is

•contrary to reason—i.e. inconsistent with our clear and distinct ideas

from what is

•above reason—i.e. something whose truth or probability we don't see to be derivable by reason from sensation or from reflection.

Thus the existence of more than one God is contrary to reason; the resurrection of the dead is above reason.

Theo: If you mean your definition of 'above reason' to capture the accepted use of this phrase, I have a comment to make about it. It seems to me that your way of putting this definition makes it too weak in one respect and too strong in another. ·Too weak·: According to your definition everything we don't know and lack the capacity to know in our present state would be above reason. For instance, whether such-and-such a fixed star is larger or smaller than the sun, or whether Vesuvius will erupt in such-and-such a year—knowledge of these facts is beyond us, not because they are 'above reason' ·in the ordinary sense of that phrase· but because they are above the senses. After all, we could judge very soundly about these matters if we had more perfect organs and more information as to the facts. There are also problems that are above our *present* faculty of reason but not above *all* reason. For instance, no astronomer on earth could calculate the particulars of an eclipse in his head in the time it takes to recite the Lord's prayer; yet there may

be Spirits for whom that would be mere child's play. Thus all these things could become known or achievable with the help of reason if we had fuller information as to the facts, more perfect organs and more exalted minds.

Phil: If I take my definition to include not only *our* sensation and reflection but also that of any other possible created mind, then that objection fails.

Theo: That is so; but then there will be the other difficulty. Too strong: by your definition ·understood in that way· nothing will be above reason, because God can always bestow the means of finding out any truth whatever through sensation and reflection. Indeed, the greatest mysteries are made known to us by God's testimony, which we recognize through the rational grounds for belief on which our religion rests—grounds that unquestionably depend on sensation and reflection. The question, then, seems to be not whether the existence of a fact or the truth of a proposition can be deduced from the sources that reason employs (from sensation and reflection, that is, or rather from the outer and inner senses), but whether a created mind is capable of knowing the *why* of this fact, the reason that makes it true. Thus we can say that what is above reason can indeed be learned, but can't be *understood*, by the methods and powers of created reason, of however great and exalted a kind. It is God's unique privilege to understand it, as it is his sole prerogative to proclaim it.

Phil: That view of the matter appears sound to me, and that is how I want my definitions to be understood. This same approach also confirms me in my opinion that **24** the way of speaking in which •reason is opposed to •faith, though authorized by common use, is improper. For it is by reason that we establish what we ought to believe. Faith is a firm assent; and when assent is regulated as it should be, it can't be

based on anything but good reason. Someone who believes something without having any reason for his belief may be in love with his own fancies, but he isn't seeking the truth and he isn't being obedient to ·God·, his divine master who wants him to use the faculties he has given him as guards against error. If his belief is true, it is by chance; and if it is wrong, that's his fault and he is accountable to God for it.

Theo: I applaud you for maintaining •that faith is grounded in reason; otherwise why would we prefer the Bible to the Koran or to the ancient writings of the Brahmins? Our theologians and other learned men have also thoroughly recognized •this; that is why we have such fine works on the truth of the Christian religion, and so many fine arguments against the pagans and other unbelievers, ancient and modern. Furthermore, wise men have always been suspicious of anyone maintaining that there's no need to trouble with reasons and proofs when it is a question of belief. Indeed one *can't* separate belief from reasons unless 'believing' something merely means reciting it, or giving in to it without giving it any thought. Many people do just this, and it is typical of some nations, even, more than of others. . . . In our own day a high-ranking person has said that in questions of faith we have to put out our eyes in order to see clearly, and Tertullian said somewhere: 'This is true because it is impossible; we must believe it because it is absurd.' But even if people who say such things have good intentions, what they say is extravagant and apt to do harm. St Paul speaks more correctly when he says that the wisdom of God is foolishness to men [1 Corinthians 2:14]. This is because men judge things only in accordance with •their limited experience, seeing as absurd anything that doesn't conform with •it. But it would be very rash to judge that such a thing is absurd; there are in fact countless natural things that

would seem just as absurd to us if we were merely *told* about them—like describing the formation of ice to someone who has never experienced it. But the order of nature itself is not metaphysically necessary; so it is grounded solely in God's good pleasure; so he can depart from it for higher reasons of grace. But we shouldn't infer that he *has* done so except on good evidence, which can come only from the testimony of God himself—testimony to which we must utterly defer once it has been duly confirmed.

Chapter xviii: Faith and reason, and their distinct provinces

Philaethes: 1 Let us adapt ourselves to common usage, and allow faith to be distinguished from reason in a certain way. But this way should be explained clearly, and the boundaries between the two should be established; for the unsettled nature of the boundaries of faith and reason has been the cause of great disputes (and perhaps even great disorders) in the world. Obviously, until those boundaries are settled we shall dispute in vain, since reason must be used in disputing about faith! 2 I find that every sect is glad to use reason when they think it will help them, and when it lets them down they cry out 'It's a matter of faith, and is above reason'. But ·this is a dangerous line for them to take, because· when they are engaged in reasoning with an opponent *he* can use the same plea, unless they can show why he isn't permitted to use it in what seems to be a parallel case. I am here taking 'reason' to be

the discovery of the certainty or probability of propositions that are deduced from knowledge acquired through the use of our natural faculties, i.e. by sensation or reflection.

And I am taking 'faith' to be

the assent to a proposition on the basis of revelation,
i.e. as having been made known to men by God in an
extraordinary way of communication.

3 But not even a man inspired by God can communicate to others any new simple ideas, because he can only use words or other signs that revive in us the simple ideas—or combinations thereof—that custom has attached to them. Thus, whatever new ideas St Paul received when he was rapt up into the third heaven, all he could say about them was that 'they are such things as eye has not seen, nor ear heard, nor has it entered into the heart of man to conceive'. Suppose that on the planet Jupiter there were creatures endowed with six senses, and that God supernaturally gave the ideas of that sixth sense to a man among us: that man couldn't by words produce them in the minds of other men. So •original revelation needs to be distinguished from •traditional revelation. The •former is an impression that is made on the mind immediately by God, and there are no limits to what its content might be. The •other comes only by the ordinary ways of communication, and can't provide any new simple ideas. **4** Truths that are discoverable by reason could instead be communicated to us through a traditional revelation, as would have been the case if God had chosen to communicate the theorems of geometry to men—though that wouldn't have given us as much certainty as if we had demonstrated the theorems from the connections of ideas. Likewise, Noah had a more certain knowledge of the flood than we have from Moses' book; just as the certainty of someone who saw that Moses actually wrote it, and that he performed the miracles that show that he was inspired, was greater than our own. **5** This is why revelation can't go against the clear evidentness of reason; because even if the revelation is immediate and original—i.e. even if it consists in God's telling someone

something—we have to know for sure that it was God speaking and that he did mean what we took him to mean; and the evidentness of *this* can never be greater than the evidentness of our intuitive knowledge. So no proposition can be accepted as divinely revealed if it contradicts this immediate knowledge that reason gives us. If we don't take that line we'll be left with no difference between truth and falsehood, no standards for separating what is credible from what isn't. Anyway, it is inconceivable that God, our generous creator, should tell us something which if accepted as true must overturn all the foundations of our knowledge and make all our faculties useless. **6** And those who receive revelation not •immediately but only •through transmission by word of mouth or by writing have all the more need of reason to assure them of its authenticity. **7** It remains true, though, that things that our natural faculties can't discover—things like the fall of the rebellious angels and the resurrection of the dead—are the proper matter of faith. **9** In these matters, only revelation should be listened to. And where probable propositions are concerned, an evident revelation will determine us even against probability.

Theophilus: If you take faith to be only •what rests on rational grounds for belief, and separate it from •the inward grace that immediately endows the mind with faith, everything you say is beyond dispute. For there's no denying that many judgments are more evident than the ones that depend on those rational grounds. People vary in how far they go with faith based on reasons; and indeed plenty of people, far from having weighed up such reasons, have never known them and consequently don't even have grounds for *probability*. But •the inward grace of the Holy Spirit makes up for this, immediately and supernaturally, and it is •this that creates what theologians call 'divine faith' in the strict

sense. It's true that God never bestows this faith unless what he is making one believe is grounded in reason—otherwise he would undercut our ability to recognize truth, and open the door to enthusiasm—but it isn't necessary that all who have this divine faith should know those reasons, let alone that they should have them perpetually before their eyes. ['Enthusiasm', like its French counterpart, was used to mean 'intense, fanatical conviction that one is hearing directly from God'. It is the topic of xix.] Otherwise none of the unsophisticated or of the feeble-minded—now at least—would have the true faith, and the most enlightened people might not have it when they most needed it, since no-one can always remember his reasons for believing. The question of the use of reason in theology has been one of the liveliest issues, between Socinians and those who may be called Catholics in a broad sense of the term, as well as between Reformed and Evangelicals—the latter being the preferable name that is given in Germany to those whom some people inappropriately call 'Lutherans'. . . . In general one can say that the Socinians are too quick to reject everything that fails to conform to the order of nature, even when they can't conclusively prove its impossibility. But sometimes their adversaries also go too far and push mystery to the verge of contradiction, thereby wronging the truth they seek to defend. . . . The able Father Honoré Fabri denied the validity in divine matters of •the great principle that *things that are the same as a third thing are the same as each other*. Some other theologians still do so. This hands the victory to one's opponents, and deprives all reasoning of any certainty. What ought to be said rather is that in divine matters •the principle has been misapplied. . . . Principles of reason that are necessary because they have logical necessity—i.e. ones whose negations imply contradictions—should and can be safely employed in theology. But it isn't true that anything that is necessary merely through physical necessity

(i.e. necessity founded on induction from what takes place in nature, or on natural laws that God voluntarily set up) is sufficient to rule out belief in a mystery or a miracle, since God is free to change the ordinary course of things. Thus, going by the order of nature one can be confident that •one person can't be at once a mother and a virgin, and that •a human body can't be inaccessible to the senses; though the contrary of each of these is possible for God. . . . It seems to me that a question remains that hasn't been investigated thoroughly enough by authors who have debated this matter. It is this:

Suppose that on the one hand we have the literal sense of a text from Holy Scripture, and on the other we have a strong appearance of a logical impossibility or at least a recognized physical impossibility; then is it more reasonable to give up the literal sense or to give up the philosophical ·or scientific· principle?

There are certainly passages where there is no objection to abandoning the literal sense—for instance, where Scripture gives God hands, or attributes to him anger, repentance and other human feelings. [Up to here in this speech there has been some reporting on published debates between theologians—omitted from the present version—and from here on there are several pages more of the same sort of thing. Much of it concerns arguments about the fate in the after-life of 'virtuous pagans' and children who die unbaptised. Theophilus winds the discussion up thus:] The wisest course is to take no position regarding things of which so little is known, and to be satisfied with the general belief that God can do nothing that isn't entirely good and just. As Augustine said, 'It is better to doubt concerning what is hidden than to argue over what is uncertain.'

Chapter xix: Enthusiasm

Philaethes: If only all theologians, including St Augustine himself, had always acted on the maxim expressed in that passage! **1** But men believe that their spirit of dogmatism shows how much they care about the truth; when really it's just the opposite—we really love truth only in so far as we love to examine the proofs that show it to *be* the truth. And when someone jumps to a conclusion he is always driven by less high-minded impulses. **2** A quite common one is a •domineering disposition; **3** and another, which gives rise to enthusiasm, is a certain •complacent satisfaction with our own day-dreams. 'Enthusiasm' is the name given to the defect of someone who thinks that something that isn't grounded in reason is an immediate revelation. **4** We can say that

reason is natural revelation, of which God is the author just as he is the author of nature,

and •parallel with that• we can say that

revelation is supernatural reason, that is, reason enlarged by a new set of •discoveries communicated by God immediately.

But these •discoveries are possible only if we have means to recognize them, and that's precisely what reason is. To take away reason so as to make way for revelation would be like putting out one's eyes to get a better view of the moons of Jupiter through a telescope! **5** Enthusiasm is encouraged by the fact that an immediate revelation is easy and short, compared with a long, tedious and not always successful labour of reasoning. [He talks about the psychological roots of enthusiasm, its harmfulness, and the difficulty of curing it. Then:] **8** Fanatics liken their opinions to matters of seeing and feeling. They see the divine light as we see sunlight at noon, •they say•, and they don't need the twilight of rea-

son to show it to them! **9** They are sure because they are sure, and their conviction is right because it is strong—for that's all their metaphorical language amounts to. **10** But as there are two perceptions—of the proposition and of the revelation—they can be asked *where* the clear light is to be found. If what they clearly see is •that the proposition is true, then they don't need a revelation •telling them that it is true•. So •the alleged clearness• must be in •the feeling that they are receiving a revelation; but how can they see that it is God who reveals it, and that it isn't a will-o'-the-wisp that leads them continually round in this circle: *It is a revelation because they firmly believe it, and they believe it because it is a revelation.* [He goes on about how uncritical zeal lays one open to error, how we must use *reason* to distinguish God's speech from Satan's, and how revelations reported in the Bible were accompanied with miraculous outward signs—e.g. Moses heard a voice from within a bush that burned without being burned up. Then:] **16** However, I don't deny that God does sometimes bring important truths into men's minds, or stir them to good actions, by the immediate influence and assistance of the Holy Spirit without any extraordinary signs accompanying it. But in such cases we have reason and the Scripture, two unerring rules for judging these 'illuminations'. For if they conform to these rules we at least *run no risk* in viewing them as •inspired by God, even if not as •immediate revelations.

Theophilus: 'Enthusiasm' was at first a favourable name. Just as 'sophism' indicates literally an exercise of wisdom, so 'enthusiasm' signifies that there is a divinity inside us. [These are the meanings of the ancient Greek words from which 'enthusiasm' and 'sophism' are derived.] Socrates claimed that a God or Daemon gave him inner warnings, so that enthusiasm in his case would be a divine instinct. But men treated their pas-

sions as holy, and took their fancies and dreams and even their ravings to be something divine, so that 'enthusiasm' began to signify a disorder of the mind ascribed to the action of some god that was supposed to be inside those who were seized by it. For prophets and prophetesses . . . did manifest mental derangement while their god had possession of them. More recently the term has been applied to people who believe, for no good reason, that their impulses come from God. [He illustrates this with an example from Latin literature. Then:] Today's enthusiasts believe that they also receive doctrinal instruction from God. The Quakers are convinced of this, and their first systematic writer, Barclay, claims that they find within themselves a certain light which itself announces what it is. But why call something 'light' if it doesn't cause anything to be seen? I know that there are people with that cast of mind, who see sparks and even something brighter; but this image of corporeal light, aroused when their minds become over-heated, brings no light to the mind. [He reports, with an example, that 'enthusiasts' sometimes say or do things that astonish themselves and others. Then:] There are people who, after a period of austere living or of sorrow, experience peace and consolation in the soul; this delights them, and they find such sweetness in it that they believe it to be the work of the Holy Spirit. It is certainly true that the contentment we find in contemplating God's greatness and goodness, and in carrying out his wishes and practising the virtues, is a blessing from God, and one of the greatest. But it is not always a blessing that needs renewed supernatural assistance, as many of these good people claim. [Then a page or more of reports of •visionaries who attracted public attention, some of them quite sensible in other ways; and of •sharp disagreements amongs their followers. Then:] It is indeed desirable that good people should agree with one another and should work in unison; nothing could con-

tribute more to making the human race better and happier. But they must themselves be people of good will, i.e. people who do good and are reasonable and ready to learn. Whereas all too many of those who are called 'religious' nowadays are accused of being dour and arrogant and unyielding. Their disputes show, at the least, that their inner witness needs outer verification if it is to be believed; they oughtn't to be accepted as inspired prophets until they have worked some miracles. Still, such inspired utterances could bring their evidence with them; this would be the case if they truly enlightened the mind through the important revelation of some surprising truth that the person in question couldn't possibly have discovered without help from outside. [He gives examples of 'prophets' who have tried to authenticate their revelations by miracles, usually suspect ones. Then:] Still, such beliefs do sometimes have good results and lead to great things, for God can make use of error to establish and preserve the truth. But I don't think we are entitled glibly to employ pious frauds for good purposes. And as for the dogmas of religion, we have no need for new revelations: if we are presented with rules that are conducive to salvation we're bound to obey them, even if the person who presents them doesn't perform any miracles. And although Jesus Christ had the power to perform miracles, he sometimes refused to exercise it for the gratification of 'this evil generation' who 'seek a sign', when he was preaching only •virtue and •what had already been taught by natural reason and the prophets.

Chapter xx: Error

Philaethes: 1 Having said enough about our ways of knowing or guessing the truth, let us now say something about our errors and wrong judgments. (Men must often be in error, since they disagree with one another so much!) The reasons for error all come down to these four:

- Lack of proofs.
- Lack of ability to use proofs.
- Lack of desire to use proofs.
- Wrong measures of probability.

[Reminder: Here ‘proof’ means ‘evidence’ or ‘rational reasons for belief’. It is much weaker than ‘demonstration’ or ‘knock-down rigorously logically valid argument’.] 2 When I speak of ‘lack of proofs’, I am talking about a lack not only of proofs that somebody has assembled but also of the ones that *could* be had if we had the requisite means and opportunity—which in most cases we don’t. They are lacking for men whose lives are spent earning a living. Such men are no more informed about what goes on in the world than a packhorse that is driven constantly on the same road can be skilled in the geography of the country. To be decently informed they would need languages, reading, conversation, observations of nature, and experience of the practical arts. 3 Since none of that is suitable to their position in life, shall we then say that the bulk of mankind has no guide except blind chance to lead them to their happiness or away from misery? Must they give themselves over to the current opinions and licensed guides of the country they live in, even with regard to everlasting happiness or unhappiness? If so, doesn’t that imply that someone might be eternally unhappy because he was born in one country rather than another? I have to admit, though, that no man is so completely taken up with earning a living that he has no spare time *at all* to think of his soul, and to inform himself

in matters of religion—if he cared about this as much as he cares about less important matters.

Theophilus: Let us take it that men aren’t always in a position to instruct themselves, and that since they can’t prudently give up providing for their families in order to search after elusive truths, they are compelled to abide by the views that are given authority in their societies. Still, we ought to judge that, in those who have the true religion without having proofs of it, inward grace will be making up for the absence of rational grounds for belief. And charity leads us to judge further, as I have already remarked to you, when good people are brought up among the deep shadows of the most dangerous errors, God will do for them everything that his goodness and justice require, even though we may not know how. . . . He can save souls by the inward working of the Holy Spirit, with no need of any great miracle. What is so good and comforting for mankind is the fact that to be in the state of God’s grace one needs only to have, sincerely and seriously, a good will. I accept that this good will itself comes through the grace of God, in that *every* good—natural or supernatural—comes from him; but, still, it’s enough to know this: all one needs for salvation is such a will, and God couldn’t possibly have set an easier or more reasonable condition.

Phil: 5 There are people who don’t have the skill to make use of the evidences that they have—right at hand, so to speak—and who can’t carry a long train of consequences, or weigh all the circumstances. There are men who can manage only one syllogism, others who can manage only two. This isn’t the place to decide whether this limitation arises from natural differences in the souls themselves or in the organs, or whether it comes from the person’s not having used his intellectual abilities sufficiently. All that matters

here is that people do visibly differ in this respect, and that one has only to go from Parliament or the Stock Exchange to the lunatic asylum or the shelters for the homeless in order to be aware of it.

Theo: It is not only the poor who are in need. Some rich people lack more than the poor do, because they *want* too much and thus voluntarily put themselves into a kind of poverty that stops them from giving their attention to important matters. Example is very important here. People carefully follow the example of their peers, and if they want to be socially successful they have to do this without seeming reluctant, and this easily leads to their becoming *like* their peers. It's very hard to satisfy reason and custom both at once! As for those who lack basic intellectual ability: there may be fewer of these than you think, for I believe that good sense together with diligence can achieve any task for which speed is not required. I stipulate good sense because I don't think you would require the inmates of the lunatic asylum to engage in the pursuit of truth. The fact is that most of *them* could recover, if only we knew how to bring this about. Whatever inherent differences there are between our souls (and I believe there are indeed some), there is no doubt that any soul could achieve as much as any other, though perhaps not so quickly, if it were given proper guidance.

Phil: 6 There is another sort of person whose only lack is in their *will*. Their hot pursuit of pleasure, or constant drudgery in the making of money, or laziness and negligence in general, or a particular dislike for study and meditation, keep them from any serious thoughts about the truth. There are even some who fear that a really impartial inquiry wouldn't favour the opinions that best suit their prejudices and plans. We know some men won't read a letter that they think brings bad news; and many men abstain from doing their accounts

or inquiring into the state of their affairs, for fear of learning something that they would prefer to go on not knowing. There are some who have great incomes that they spend wholly on provisions for the body, without thinking about how to improve their understandings. They take great care to appear always in a neat and splendid outside, yet contentedly allow their minds to be dressed in miserable rags of prejudice and error, and allow their nakedness—i.e. their ignorance—to show through. Apart from the concern they ought to have with their state in the after-life, they are just as neglectful of the things they need to know for their life in *this* world. It's a strange thing that very often those who believe that their birth or fortune entitles them to have power and authority carelessly abandon power and authority to others whose condition is lower than theirs but who surpass them in knowledge. For those who are blind must be led by those who see, or else fall into the ditch. And there is no worse slavery than slavery of the understanding.

Theo: Health is one of our greatest blessings, yet people don't take trouble to know and do what would be conducive to health—striking evidence of their carelessness about their real interests! And this applies to those at the top of the heap as well as to those lower down, though they are all equally affected by threats to health. As for matters regarding the faith: some people look on the sort of thought that might bring them to an examination of *that* as a temptation of the Devil that is best overcome by turning the mind to something quite different. . . . One wishes that the men who have power had knowledge in proportion: even if it didn't include knowledge of the sciences, the practical arts, history, and languages, it might suffice if they had sound, practised judgment and knowledge of broad and general matters—i.e. the most important points. . . .

Phil: 7 Finally, most of our errors come from our wrongly estimating probabilities—suspending judgment on a proposition that there are obvious reasons to accept, or accepting a proposition in the face of contrary probabilities. These wrong estimates come from:

- (1) treating doubtful propositions as though they were principles,
- (2) generally accepted hypotheses,
- (3) predominant passions or inclinations, and
- (4) authority.

8 ·I shall discuss these in order·. (1) We usually judge whether something is true on the basis of how it fits with what we look on as unchallengeable principles; and that leads us to dismiss the testimony of others, and even that of our senses, when they appear to be contrary to those principles. But before putting such confident trust in the latter, we should examine them with the utmost strictness. 9 Children have propositions insinuated into them by their father and mother, nurses, tutors, and others around them; and once these propositions have taken root they are treated as a sacred oracle set up in their minds by God himself. 10 Anything that offends against these internal oracles can hardly be tolerated, whereas the greatest absurdities that fit with them are swallowed whole. This shows up in how *obstinately* different men hold to quite contrary opinions as though they were articles of faith, though in many cases they are equally absurd. [He winds up with a jibe at what he takes to be the evangelical Christian view of the Eucharist, which he says implies ‘that a single thing is at once flesh and bread’. Theophilus sharply says that this misrepresents the evangelicals, and then goes into much detail about the finer points of doctrine surrounding the Eucharist and the various sects’ different views about them. Philalethes apologizes for having mis-spoken, and then continues:] 11 But let us

move on from established principles to (2) generally accepted hypotheses. People who know that these are only *hypotheses* nevertheless often defend them fervently, almost like assured principles, and play down the contrary probabilities. It would be intolerable to a learned professor to have his authority instantly overturned by an upstart innovator who rejected his hypotheses—his authority of thirty or forty years standing, acquired at great expense of time, supported by much Greek and Latin, and confirmed by general tradition and a reverend beard! Using *arguments* to convince him of the falsity of his hypothesis would be like the wind trying to get the traveller to part with his cloak, and having the effect of making him hold onto his cloak ever more tightly.

Theo: Indeed, the Copernicans have learned from their experience of their opponents that hypotheses that are recognized as such are still upheld with ardent zeal. And Cartesians are as emphatic in defence of their ‘striated particles’ and ‘little spheres of the second element’ as if they were theorems of Euclid. Our zeal in defence of our hypotheses seems to be merely a result of our passionate desire for personal respect. It is true that those who condemned Galileo believed that the earth’s state of rest was more than an hypothesis, for they held it to be in conformity with Scripture and with reason. But since then people have become aware that reason, at least, no longer supports it; and as for Scripture, Father Fabri took this matter up in the course of one of his writings, where he said openly that the understanding of the sacred text as referring to a true movement of the sun was only a provisional one, and that if Copernicus’s view came to be verified there would be no objection to expounding the passage in the same way as we do Virgil’s ‘The lands and the cities recede’ ·as one sails out to sea·. Yet they still go on suppressing the Copernican doctrine in Italy and Spain,

and even in the hereditary domains of the Emperor. This is greatly to the discredit of those nations: if only they had a reasonable amount of freedom in philosophizing, their minds could be raised to the most splendid discoveries.

Phil: **12** It does appear, as you say, that **(3)** prevailing passions are indeed the source of men's love of hypotheses; but passions extend much further than that. The greatest probability in the world will be powerless to make a greedy or ambitious man see that he is unjust; and nothing could be easier than for a lover to let himself be deceived by his mistress We have two ways of evading the most apparent probabilities when they threaten our passions and prejudices. **13** The first is to think that there may be a fallacy hidden in the argument that is brought against us. **14** The second is to suppose that we could advance equally good or even better arguments to defeat our opponent if we had the opportunity or the cleverness or the help that would be needed to find them. **15** These ways of holding off belief are sometimes sound; but it's illegitimate to use them in a case where •the issue has been set out quite clearly and •everything has been taken account of; for once *that* is done, there are ways of determining which side has the greater over-all probability. Thus, there are no grounds for doubting that

animals were formed through motions guided •by a thinking being rather than •through a chance coming together of atoms.

Just as no-one has the slightest doubt that

the printers' letters that make an intelligible discourse have been put together •by human care rather than •by random jumbling.

I don't think that we are free to withhold our assent over matters like those; but we can do so when the probability

is less clear, and we can settle for the less well supported proposition if it suits our inclination better. [That last clause threatens to conflict with the next sentence. The clause misrepresents Locke, who wrote that a man can 'content himself with the proofs he has, if they favour the opinion that suits his inclination or interest, and so stop further search'.] But it seems to me that a man can't lean to the side that seems to him to be the less probable, because **16** perception, knowledge and assent are not freely chosen; just as it isn't open to me to see or not see the agreement of two ideas when my mind is directed towards them. Yet we can voluntarily *stop investigating*; if we couldn't, ignorance and error could never be our fault. That is where we exercise our freedom. In cases where one's interests aren't involved, indeed, one accepts the common opinion, or that of the first comer. But in matters that concern our happiness or unhappiness, the mind sets itself more seriously to weigh the probability: I believe that then, i.e. when we are attending, we aren't free to *choose* which side to take, if there are obvious differences between the two. The greater probability, I think, will determine the assent.

Theo: Fundamentally I share your view; and we have already said enough about this when we treated of freedom in our earlier discussions. I showed then that •what we believe is never just •what we want to believe but rather •what we see as most likely; and that nevertheless we can bring it about *indirectly* that we believe what we want to believe. We can do this by turning our attention away from a disagreeable object so as to apply ourselves to something else that we find pleasing; so that by thinking further about the reasons for the side that we favour, we end up by believing it to be the most likely. As for opinions that we hardly care about at all, and that we embrace for feeble reasons: that happens because when an opinion has been put to us in a favourable

light and we can see almost nothing against it, we find it superior to the opposing view, which has no support that we can see, by at least as much as if there were many reasons on both sides; for the difference between 0 and 1, or between 2 and 3, is just as great as that between 9 and 10. We are aware of that superiority, and we give no thought to—and aren't encouraged to engage in—the kind of scrutiny that would be needed for a sound judgment to be made.

Phil: 17 The last wrong way of estimating of probability that I shall take notice of is (4) misunderstood authority, which keeps more people in ignorance or error than all the others put together. We see ever so many men who have no basis for their belief except the opinions that are accepted among their friends or the members of their profession, or within their party or their country. They seem to think: 'This doctrine has had the approval of reverend antiquity, it comes to me with the passport of earlier centuries, other men accept it, so I don't run any risk of error in accepting it myself.' Getting one's opinions in that sort of way is as bad as getting them by flipping a coin! Apart from the fact that all men are liable to error, I think that if we could only see the secret motives that influenced the men of learning and the leaders of parties we'd often find something quite different from the sheer love of truth. Anyway, there is no opinion so absurd that it couldn't be arrived at in this way, because there is almost no error that hasn't had its supporters.

Theo: It must be admitted, though, that in many cases one can't help yielding to authority. St Augustine wrote a rather good book, *On the Usefulness of Belief*, which is worth reading on this subject. As for received opinions: they have in their favour something close to what creates a 'presumption', as the legal theorists call it [see page 227]; and although one isn't obliged always to adopt them without proof, neither

is one permitted to destroy them in the minds of others unless one has proofs against them. The point is that it is wrong to alter anything without reason. In recent years there has been much controversy over *the argument from large numbers*—the large numbers of people holding a given view—but when that argument is applied to approval of a reason rather than testimony to a fact, the most that can be secured through it is something tantamount to what I have just been saying. Just as a hundred horses run no faster than one, although they can haul a greater load, so with a hundred men as compared with a single man: they can't walk any straighter, but they will work more effectively; they can't judge better, but they will be able to provide more of the materials on which judgment may be exercised. That is the meaning of the proverb *Two eyes see more than one*. This can be observed in assemblies, where vast numbers of considerations are presented that one or two people might never have thought of; though there is often a risk that the best decision won't be reached through these considerations, because no competent people have been given the task of thinking them over and weighing them up. That is why some judicious theologians of the Roman sect, seeing that the authority of the Church—i.e. of its highest-ranking dignitaries, and those with the most popular support—couldn't be infallible in matters concerned with reasoning, have restricted it to the mere certification of facts under the name of tradition. . . . In a book that was that was approved by the theologians of his order the learned Bavarian Jesuit Gretser expressed the opinion that the Church, relying on the promised aid of the Holy Spirit, can pass judgment on controversial matters by developing new articles of faith. Mostly they try to disguise this view, especially in France, claiming that the Church merely clarifies doctrines that are already established. But the clarification is either a pronouncement that is accepted

already or a new one that is believed to be derived from accepted doctrine: the former case seldom occurs in practice, and as for the latter—the establishment of some new pronouncement—what can that be but a new article of faith? However, I don't favour contempt towards antiquity in religious matters. And I'm even inclined to think that God has until now protected the councils of the whole Church from any error that is contrary to saving doctrine. But what a strange thing sectarian prejudice is! I have seen people ardently embrace an opinion merely because it is accepted in their order, or even just because it conflicts with the opinions of someone whose religion or nationality they dislike, even though the question has almost nothing to do with religion or with national interests. They may not have known that their zeal really arose from that source; but I have noticed that on first hearing that a certain person has written such and such a thing, they have rummaged through libraries and boiled up their animal spirits in the search for something with which to refute him. The same thing is often done, too, by people defending theses in universities and trying to shine against their adversaries. But what are we to say of the doctrines that are laid down in the symbolic books of the various sects, even among the Protestants, which people are often obliged to accept on their oath? There is a distinction between teaching a view and accepting it: no oath in the world, and no prohibition, can compel a man to stay with an opinion, because beliefs are inherently involuntary; but he can and should abstain from *teaching* a doctrine that is thought to be dangerous, unless he finds that his conscience compels him to it. And in the latter case he should, if he is an appointed teacher, frankly declare where he stands and resign from his post—provided he can do so without putting himself into great danger, for that might compel him to leave quietly. That seems to be almost the only way of reconciling

•the rights of society with •the rights of the individual, where society has to prevent something it judges to be bad, while the individual can't excuse himself from the duties laid on him by his conscience. . . .

Chapter xxi: The classification of the sciences

Philalethes: Here we are at the end of our journey, with all the operations of the understanding made clear. We aren't planning to explore the detail of what we know; but still it may be appropriate, before we finish, to look it over in a general way by considering the divisions of the sciences. **1** Everything that can come within the range of human understanding is either •the nature of things in themselves, •man considered as an agent who is inclined towards goals, especially his happiness, or •the means whereby knowledge is gained and communicated. So there you have science divided into three sorts. **2** The first is *physica* or natural philosophy [here = 'philosophy and science'], which takes in not only

bodies and their numbers, shapes etc.

but also

spirits, God himself, and the angels.

3 The second is practical philosophy, or ethics, which teaches how to attain things that are good and useful, aiming not only at knowledge of the truth but also at doing what is right. **4** The third is logic or the doctrine of signs (*logos* is Greek meaning 'word'). To communicate our thoughts to one another, as well as record them for our own use, signs of our ideas are necessary. If we paid *really* careful attention to this third kind of science that turns on ideas and words, perhaps we might get a kind of logic and system of criticism different

from what we have known up to now. **5** And these three sorts—natural philosophy, ethics, and logic—are the three great provinces of the intellectual world, wholly separate and distinct one from another.

Theophilus: That division was a famous one even among the ancients. Like you, they took logic to include everything having to do with words and with making our thoughts known—the art of speaking. But there is a problem about this, namely that

the science of reasoning, of judgment and of discovery appears to be quite different from

the knowledge of etymologies and language-use

—knowledge that is neither determinate nor principled. Furthermore, one can't •explain words without •getting into the sciences themselves, as you can see from dictionaries; and conversely you can't •present a science without at the same time •defining its terms. But the chief problem about that division of the sciences is that each of the branches appears to swallow the others. Firstly, •ethics and •logic fall under •natural philosophy when that is taken as broadly as you have just done. For in treating of spirits, i.e. substances with understanding and will, and giving a thorough account of their understanding, you will bring in •the whole of logic; and if your doctrine about these spirits includes an account of matters pertaining to the will, you will have to talk about good and evil, happiness and misery, and it's entirely up to you whether you develop that topic far enough to bring in •the whole of practical philosophy. On the other hand, *everything* is relevant to our happiness, and so could be included within practical philosophy. As you know, theology is rightly regarded as a practical science; and jurisprudence and medicine are just as practical. So that the study of human happiness or of our well- and ill-being, if it deals

adequately with all the ways of reaching the goal that reason sets before itself, will take in everything we know. . . . And the study of languages, which you and the ancients take to belong to logic, i.e. to what is deductive, will in turn annex the territories of the other two—by treating every topic in alphabetically arranged dictionaries. So there are your three great provinces of the realm of knowledge, perpetually at war with one another because each of them keeps encroaching on the rights of the others! The nominalists thought there are as many particular sciences as there are truths, with the truths falling into groups only in so far as someone has organized them in that way. Others compare the totality of our knowledge with an uninterrupted ocean that is divided into the North Sea, the Atlantic Ocean, the Indian Ocean and the Red Sea only by arbitrary lines. A single truth can usually be put in different places, according to the various terms it contains. [He goes on at some length, with examples, about how a particular fact or event may be classified in several different ways, none of them incorrect. Then:] But now let us speak only of general doctrines, setting aside particular facts, history, and languages. I know of two main ways of organizing the totality of doctrinal truths. Each has its merits, and is worth bringing in. [We are about to encounter the terms 'analytic' and 'synthetic' with senses that were standard in Leibniz's but are aren't today. They label two ways of *presenting* scientific or philosophical results. Synthetic: start with what is most •general and basic, and then work down to more specific truths that are derived from and thus explained by the ones you started from. Analytic: mode you start with what is most •familiar, and work upwards from there to more general truths that explain the ones you started from.] **(1)** One is synthetic and theoretical: it involves setting out truths according to the order in which they are proved, as the mathematicians do, so that each proposition comes after those on which it depends. **(2)** The other arrangement is analytic and prac-

tical: it starts with the goal of mankind, namely with the goods whose sum total is happiness, and conducts an orderly search for means that will achieve those goods and avoid the corresponding evils. These two methods are applicable to the realm of knowledge in general, and some people have also used them within particular sciences. Even geometry, which Euclid treated synthetically as a science, has been treated by others as an art, ·i.e. a system of techniques·; but even as an art it could still be handled demonstratively, and that would even show how the art is discovered. . . . If we were writing an encyclopedic account of the whole of knowledge, employing both methods at once, we could use a system of references so as to avoid repetition. **(3)** To these two kinds of arrangement we must add a third. It is classification by terms, and really all it produces is a kind of inventory. The inventory could be systematic, with the terms being ordered according to certain categories that are independent of all languages, or it could have an alphabetical order within the accepted language of the learned world. This inventory is needed if one is to assemble all the propositions in which a given term occurs in a significant enough way. For in the other two procedures, where truths are set out according to **(1)** their origins or according to **(2)** their use, the truths that concern some one term can't all occur together. For example, when Euclid was explaining how to bisect an angle, it wouldn't have been permissible for him to go straight on with the method for trisecting angles, because that would have required reference to conic sections, which couldn't be taken account of at that stage in the work. But the inventory could and should indicate the locations of the important propositions concerning a given subject. We still have no such inventory for geometry. It would be a very useful thing to have, and could even be a help to discovery and to the growth of that science, for it would relieve the memory and

would often save us the trouble of searching out anew something that has already been completely found. And there is even more reason why these inventories should be useful in the other sciences, where the art of reasoning has less power, and they are utterly necessary in medicine above all. It would require a good deal of skill to construct them. Well, now, it strikes me as curious that •these three kinds of arrangement correspond to the ancient division, revived by you, which divides science or philosophy into theoretical, practical and deductive, or into natural philosophy, ethics and logic. The •synthetic arrangement corresponds to the •theoretical, the •analytic to the •practical, and the •one with an inventory according to terms corresponds to •logic. So the ancient division serves very well, just so long as it is understood in the same way as the above three arrangements on the account I have just given of them—namely, not as distinct sciences but rather as different ways in which one can organize the same truths, if one sees fit to express them more than once. There is also an administrative way of dividing the sciences, according to the faculties ·of universities· and the professions. This is used in the universities and in organizing libraries. . . . The accepted administrative division, according to the four faculties—Theology, Jurisprudence, Medicine and Philosophy—deserves respect. •Theology treats of eternal happiness, and of everything that bears on that in so far as it depends on the soul and the conscience. It is a sort of jurisprudence that has to do with the matters that are said to concern the 'inner tribunal' ·of conscience·, and that brings in invisible substances and minds. •Jurisprudence is concerned with government and with laws, whose goal is the happiness of men in so far as it can be furthered by what is outer and sensible. Its chief concern, though, is only with matters that depend on the nature of the mind, and it doesn't go far into the detail of corporeal things, taking

their nature for granted in order to use them as means. This at once relieves it of one large matter, namely the health, strength and improvement of the human body—the care of that being assigned to the faculty of •Medicine. Some people have believed, not without reason, that along with the others there should be an *Economic* faculty: this would include the mathematical and mechanical arts, and everything having to do with the fine points of human survival and the conveniences of life; and it would include agriculture and architecture. But the faculty of •Philosophy is left to pick up everything that isn't contained in the three faculties that are deemed to be superior. That wasn't a very good thing to do, for it has left those in this fourth faculty with no way of improving their skills by exercising them, as can those who teach in the other faculties. And so the faculty of Philosophy, except perhaps for mathematics, is regarded as merely an introduction to the others. That's why it is expected to teach young people history and the arts of speaking, and also to teach—under the titles of metaphysics or pneumatology [= 'psychology'], ethics and politics—some of the rudiments of natural theology and jurisprudence, which are independent of divine and human laws; with a little natural science as well, for the benefit of the young physicians. There, then, is the administrative division of the sciences, in accordance with the professional bodies of learned men who teach them.

And then there are the professions whose members serve society other than by what they say, and who ought to be guided by those who are truly learned—if only learning were valued as it ought to be! Even in the higher manual arts there has been an alliance of practice with learning, and it could go further. As indeed they *are* allied in medicine, not only in ancient times when physicians were also surgeons and apothecaries, but even today, especially among the chemists. This alliance between practice and theory can also be seen in war, and among those who teach manoeuvres, among painters, sculptors and musicians, and among certain other kinds of virtuosi. If the principles of all these professions, arts and even trades were taught in a practical way by the philosophers—or it might be in some other faculty of learned men—the latter would truly be the teachers of mankind. But this would require many changes in the present state of things in literature, in the education of the young, and thus in public policies. When I reflect on how greatly human knowledge has increased in the past century or two, and how easy it would be for men to go incomparably further along the road to happiness, I'm not in despair of the achievement of considerable improvements, in a more peaceful time under some great monarch whom God may raise up for the good of mankind.