

1. Francis Bacon (1607)

PHENOMENA OF THE UNIVERSE or NATURAL HISTORY For THE BUILDING UP OF PHILOSOPHY

Source: *Natural History for the Building Up of Philosophy*, 1609, 19th Century English edition; first 5 pages from the Preface.

PREFACE

Since it seems to me that people do not keep strictly to the straight and narrow when forming their opinions or putting things to the test, I have decided to use all the means at my disposal to remedy this misfortune. For in nothing else does the aspiration to deserve well show itself than it things are so arranged that people, freed both from the hobgoblins of belief and blindness of experiments, may enter into a more reliable and sound partnership with things by, as it were, a certain literate experience. For in this way the intellect is both set up in safety and in its best state, and it will besides be at the ready and then come upon harvests of useful things.

Now the beginnings of this enterprise must in general be drawn from natural history; for the whole body of Greek philosophy with its sects of all kinds, and all the other philosophy we possess seem to me to be founded on too narrow a natural-historical basis, and thus to have delivered its conclusions on the authority of fewer data than was appropriate. For having snatched certain things from experience and tradition, things sometimes not carefully examined or ideas nor securely established, they leave the rest to meditation and intellectual agitation, employing *Dialectic* inspire greater confidence in the matter.

But the chemists and the whole pack of mechanics and empirics, should they have the temerity to attempt contemplation and philosophy, being accustomed to meticulous subtlety in a few things, they twist by extraordinary means all the rest into conformity with them and promote opinions more odious and unnatural than those advanced by the very rationalists. For the latter take for the matter of philosophy very little out of many things, the former a great deal out of a few, but in truth those courses are weak and past cure. But the Natural History which has been accumulated hitherto may seem abundant on casual inspection, while in reality it is sketchy and useless, and not even of the kind I am seeking. For it has not been stripped of fables and ravings, and it rushes into antiquity, philology and superfluous narratives, neglectful and high-handed in matters of weight, overscrupulous and immoderate in matters of no importance. But the worst thing about this abundance is that it has embraced the inquiry into things natural but largely spurned that into things mechanical. Now the latter are far better than the former for examining nature's recesses; for nature of its own accord, free and shifting, disperses the intellect and confuses it with its variety, but in mechanical operations the judgement is concentrated, and we see nature's modes and processes, not just its effects. Yet, on the other hand, all the subtlety of mechanics stops short of what I am seeking. For the craftsman, intent on his work and its end, does not direct his mind or put his hand to other things, things which perhaps do more for the inquiry into nature.

Therefore we need more meticulous care and handpicked trials, not to mention funding and the utmost patience besides. For it has ruined everything in the experimental field that right from the beginning men have continually aimed at Experiments of Fruit not ones of Light, and have devoted their energies entirely to producing some splendid work, not to revealing nature's oracles, which is the work of works and encompasses in itself all power. It also comes about from men's misguided conceit that they have mostly applied themselves to things hidden and rare, and put their efforts and inquiry into those while spurning common experiments and observations, and this seems to have come about either because they sought admiration and fame, or because they fell for the belief that the function of philosophy lies in accommodating and reducing rarer events to those which occur familiarly, not equally to unearthing the causes of these common things themselves and deeper causes of those causes.

But the main point of the whole accusation against natural history is that men have gone astray not only in the work, but in its very plan. For the natural history which is in existence seems to have been composed either for the usefulness of the experiments themselves, or for the agreeableness of their narratives, and to have been made for their own sake, not so as to furnish the makings of philosophy and the sciences and as it were breast-feed them.

Thus, as far as it is within my power, I do not wish to fail to do my duty in this matter. For I have long since decided how much I should grant to abstract philosophies. Indeed, I believe that I hold fast to the ways of true and good induction, in which all things lie, and which can help the frail and crippled faculty of human intellect towards the sciences, as by mechanical aids or by some thread to guide it through a labyrinth. Nor am I unaware that if I had been willing to restrict that instauration of the sciences which I have in mind to any of the greater

inventions, I could perhaps have harvested a greater crop of honour. But since God has given me a mind which knows how to submit itself to things and which readily rejects the specious out of a sense of what is right and from confidence that things will turn out well, I have also taken upon myself that part of the work which I think others have wanted either to avoid entirely, or to treat in a way different from my idea of it.

But there are two things which I wish to warn people about in this connection both for the future and, since I am girding myself for the very thing itself, for now especially. The *first* is to get rid of that idea which, though it be utterly false and harmful, easily invades and takes hold of men's minds, namely that the inquiry into particulars is something infinite and without end, when it would be truer to say that the way of opinions and disputations is the trifling one; but in fact these vain imaginings are condemned to perpetual errors and infinite disturbances, whereas particulars and the informations of the sense (which, when individuals and the gradations of things have been left out, is sufficient for the inquiry into truth) allow understanding for certain, and that, to be sure, neither forlorn nor hopeless.

The *second* is that I would have men never forget what is involved and, when they have come across troops of thoroughly vulgar things, things slight and to all appearances frivolous, even vile, and which (as the man says) must be brought in with an apology, they do not think I am trifling, or reducing the human mind to things beneath its dignity. For these things are neither examined nor described for their own sake, but in fact there is simply no other alternative open to the human intellect, and the grounds of the work are left insecure without them. I am then certainly undertaking the most serious business of all and most worthy of the human mind, that nature's light, pure and quite unclouded by vain imagination (that light whose name has sometimes been mentioned thus far, while people have known nothing about the thing itself), may be lit in this age of ours by a torch furnished and brought near by the Divine Will.

For I do not hide the fact that I believe that preposterous subtlety of argument and thought can by no means put things right again, though all the intellects of all ages be gathered together, when, at the proper time, the subtlety and truth of the basic information or true induction have been overlooked or incorrectly established, but that nature, like fortune, is long-haired at the front and bald at the back. It remains, therefore, for the matter to be attempted anew, and that with better help and with the zeal of opinions laid aside, so that we may enter into the kingdom of philosophy and the sciences (in which human power is situated, for nature is conquered only by obeying it) in the way that we gain access to the Kingdom of Heaven, which none may enter save in the likeness of a little child. Yet I do not wholly despise the base and indiscriminate custom of working by experiments themselves (for it may doubtless suggest very many useful things to men's knowledge and invention, according to the variety of their arts and capacities), nevertheless I think it is something very trivial in comparison with that entrance into human knowledge and power which I hope for from the Divine Mercy, which indeed I again humbly beseech to allow me to endow the human family with new alms through my efforts.

The nature of things is either *free*, as in *species*, or *disturbed*, as in *monsters*, or *confined*, as in *experiments* of the Arts; yet its deeds of whatever kind are worthy of report and history. But the *History of Species* currently available, as for example of plants, animals, metals and fossils, is puffed up and full of curiosities; the *History of Marvels* empty and based on rumour; the *History of Experiments* detective, attempted piecemeal, dealt with carelessly, and entirely for practical not philosophical use.

Therefore it is my resolve to curb the History of Species, to shake our and purify the History of Marvels, but to our special effort into Mechanical and Artificial Experiments where nature gives in to human intervention. For what are the sports and frivolities of nature to us? That is, the tiny differences of species as to shape, which contribute nothing to works but in which Natural History none the less abounds. Now knowledge of Marvels certainly pleases me, if it be purified and sifted; but why in the final analysis is it pleasing? Not for the fun of being astonished, but because it often reminds Art of its duty to lead nature knowingly where it has itself sometimes gone before of its own accord.

In general I assign the leading roles in shedding light on nature to artificial things, not only because they are most useful in themselves, but because they are the most trustworthy interpreters of natural things. Can it be said that anyone had just happened to explain the nature of lightning or a rainbow as clearly before the principles of each had been demonstrated by artillery or the artificial simulacra of rainbows on a wall? But if they are trustworthy interpreters of causes, they will also be sure and fertile indicators of effects and of works. However, I do not think it appropriate to divide my history in accordance with this threefold partition, so as to deal with singular instances separately, but I shall mix the three kinds, joining things natural with artificial. ordinary with extraordinary, and paying very close attention to all the most useful ones.

Now it would be more usual to begin with the phenomena of the ether. But I, sacrificing nothing of the seriousness of my undertaking, shall give priority to things which make up and answer to a nature more general, in which both globes share. I shall begin in fact with a history of bodies according to the difference which seems the simplest, that is, the abundance or paucity of the matter contained and spread out within the same space or

boundaries, seeing indeed that none of the pronouncements about nature is truer than that double proposition. *Nothing comes from nothing, nor is anything reduced to nothing*, but *the very quantum of nature*, or *the whole sum of matter* always remains and stays the same, and is in no way increased or diminished. Moreover, it is no less certain. even though not so clearly noted or asserted (whatever stories people make up about the impartial potential of matter towards forms) that more or less of this quantity of matter is contained in the same volumes of space according to the diversity of the bodies which occupy them, bodies some of which we find to be very obviously more compact, others more extended or diffuse. For a vessel or cauldron filled with water and air does not hold an equal portion of matter, but more of the one and less of the other. Therefore if someone claimed that a given amount of water could be made from the same amount of air, it would be the same as saying that something can come from nothing. For what you deem to be lacking from the quantity of matter would have to have been made up from nothing. On the other hand, if someone claimed that a given amount of water could be turned into the same amount of air, it would be the same as saying that something can be reduced to nothing. For what you deem to be extra in the quantity of matter would likewise have to have vanished into nothingness. There is no doubt in my mind that this business is capable of being reduced to calculation, to indefinite proportions perhaps in some things, but to ones precise and certain in others, and known to nature. As, for example, if someone said that the concentration of matter in a body of gold exceeded than of a body of spirit of wine by a factor of twenty to one or thereabouts, he would nor be wrong. So as I now mean to present the history I mentioned concerning the abundance and paucity of matter, and its coming together and expansion, things from which the notions of *Dense* and *Rare* (if properly understood) take their origin, I shall so order matters that I shall draw up the relative figures for different bodies (as of gold, water, oil, air and flame) first. Then after examining these, I shall record with calculations or ratios the retreats and expatiations of each particular body. For a given body, even without anything being added to it or taken away, or at least nor in proportion to its contraction and extension, allows itself to be gathered by various impulses both external and internal into a larger or smaller sphere. Sometimes the body struggles and strives to restore itself into its old sphere, sometimes it clearly goes beyond that and does not try to revert. Here I shall first record the courses, differences and proportions of any natural body (as to its extent) compared with its openings and closings up, that is, with its powders, its calces, its virrifications, its dissolutions, its distillations, vapours and breaths, its exhalations and inflammations; then I shall set out the actions and motions themselves, the progressions and the limits of contraction and dilatation, and when bodies restore themselves and when they go beyond than in respect of their extent; but I shall especially note the efficient causes and media by means of which such contractions and dilatations of bodies come about; and meanwhile I shall in passing append the virtues and actions which bodies get and take on from such compressions and dilatations.

And since I know well how difficult a thing it is, in the present climate of opinion, to familiarise oneself with nature right from the very beginning, I shall add my own observations to gain men's attention and arouse them to contemplation. Now as far as the demonstration or revealing of the density and rarity of bodies is concerned, I have no doubt or hesitation that as to *dense* and *palpable bodies the motion of gravity* (as they call it) may be taken as the best and most ready test, for the more compact the body, the heavier it is. But when it comes to the level of airy and spiritual things, then scales will for sure be of no use to me, and I shall need another kind of industry. I shall begin, however, with *Gold*: which of all the things we have (for philosophy has nor grown up enough for us to say anything for certain about the bowels of the Earth) is the heaviest and contains the most matter in the smallest space, and I shall relate the ratios of the rest to the sphere of this body, with the reminder that I am not dealing here with the history of weights except in so far as it sheds light for demonstrating the space or dimensions of bodies. ...

2. Rene Descartes 1635

Discourse on the Method of Rightly Conducting the Reason, and seeking Truth in the Sciences

Prefatory Note by the Author

If this Discourse appear too long to be read at once, it may be divided into six Parts: and, in the first, will be found various considerations touching the Sciences; in the second, the principal rules of the Method which the Author has discovered, in the third, certain of the rules of Morals which he has deduced from this Method; in the fourth, the reasonings by which he establishes the existence of God and of the Human Soul, which are the foundations of his Metaphysic; in the fifth, the order of the Physical questions which he has investigated, and, in particular, the explication of the motion of the heart and of some other difficulties pertaining to Medicine, as also the difference between the soul of man and that of the brutes; and, in the last, what the Author believes to be required in order to greater advancement in the investigation of Nature than has yet been made, with the reasons that have induced him to write.

Part 1

Good sense is, of all things among men, the most equally distributed; for every one thinks himself so abundantly provided with it, that those even who are the most difficult to satisfy in everything else, do not usually desire a larger measure of this quality than they already possess. And in this it is not likely that all are mistaken; the conviction is rather to be held as testifying that the power of judging aright and of distinguishing truth from error, which is properly what is called good sense or reason, is by nature equal in all men; and that the diversity of our opinions, consequently, does not arise from some being endowed with a larger share of reason than others, but solely from this, that we conduct our thoughts along different ways, and do not fix our attention on the same objects. For to be possessed of a vigorous mind is not enough; the prime requisite is rightly to apply it. The greatest minds, as they are capable of the highest excellences, are open likewise to the greatest aberrations; and those who travel very slowly may yet make far greater progress, provided they keep always to the straight road, than those who, while they run, forsake it.

For myself, I have never fancied my mind to be in any respect more perfect than those of the generality; on the contrary, I have often wished that I were equal to some others in promptitude of thought, or in clearness and distinctness of imagination, or in fullness and readiness of memory. And besides these, I know of no other qualities that contribute to the perfection of the mind; for as to the reason or sense, inasmuch as it is that alone which constitutes us men, and distinguishes us from the brutes, I am disposed to believe that it is to be found complete in each individual; and on this point to adopt the common opinion of philosophers, who say that the difference of greater and less holds only among the accidents, and not among the forms or natures of individuals of the same species.

I will not hesitate, however, to avow my belief that it has been my singular good fortune to have very early in life fallen in with certain tracks which have conducted me to considerations and maxims, of which I have formed a method that gives me the means, as I think, of gradually augmenting my knowledge, and of raising it by little and little to the highest point which the mediocrity of my talents and the brief duration of my life will permit me to reach. For I have already reaped from it such fruits that, although I have been accustomed to think lowly enough of myself, and although when I look with the eye of a philosopher at the varied courses and pursuits of mankind at large, I find scarcely one which does not appear in vain and useless, I nevertheless derive the highest satisfaction from the progress I conceive myself to have already made in the search after truth, and cannot help entertaining such expectations of the future as to believe that if, among the occupations of men as men, there is any one really excellent and important, it is that which I have chosen.

After all, it is possible I may be mistaken; and it is but a little copper and glass, perhaps, that I take for gold and diamonds. I know how very liable we are to delusion in what relates to ourselves, and also how much the judgments of our friends are to be suspected when given in our favor. But I shall endeavour in this discourse to describe the paths I have followed, and to delineate my life as in a picture, in order that each one may also be able to judge of them for himself, and that in the general opinion entertained of them, as gathered from current report, I myself may have a new help towards instruction to be added to those I have been in the habit of employing.

My present design, then, is not to teach the method which each ought to follow for the right conduct of his reason, but solely to describe the way in which I have endeavoured to conduct my own. They who set themselves to give precepts must of course regard themselves as possessed of greater skill than those to whom they prescribe; and if they err in the slightest particular, they subject themselves to censure. But as this tract is put forth merely as a history, or, if you will, as a tale, in which, amid some examples worthy of imitation, there will be found, perhaps, as many more which it were advisable not to follow, I hope it will prove useful to some without being hurtful to any, and that my openness will find some favor with all.

From my childhood, I have been familiar with letters; and as I was given to believe that by their help a clear and certain knowledge of all that is useful in life might be acquired, I was ardently desirous of instruction. But as soon as I had finished the entire course of study, at the close of which it is customary to be admitted into the order of the learned, I completely changed my opinion. For I found myself involved in so many doubts and errors, that I was convinced I had advanced no farther in all my attempts at learning, than the discovery at every turn of my own ignorance. And yet I was studying in one of the most celebrated schools in Europe, in which I thought there must be learned men, if such were anywhere to be found. I had been taught all that others learned there; and not contented with the sciences actually taught us, I had, in addition, read all the books that had fallen into my hands, treating of such branches as are esteemed the most curious and rare. I knew the judgment which others had formed of me; and I did not find that I was considered inferior to my fellows, although there were among them some who were already marked out to fill the places of our instructors. And, in fine, our age appeared to me as flourishing, and as fertile in powerful minds as any preceding one. I was thus led to take the liberty of judging of all other men by myself, and of concluding that there was no science in existence that was of such a nature as I had previously been given to believe.

I still continued, however, to hold in esteem the studies of the schools. I was aware that the languages taught in them are necessary to the understanding of the writings of the ancients; that the grace of fable stirs the mind; that the memorable deeds of history elevate it; and, if read with discretion, aid in forming the judgment; that the perusal of all excellent books is, as it were, to interview with the noblest men of past ages, who have written them, and even a studied interview, in which are discovered to us only their choicest thoughts; that eloquence has incomparable force and beauty; that poesy has its ravishing graces and delights; that in the mathematics there are many refined discoveries eminently suited to gratify the inquisitive, as well as further all the arts and lessen the labour of man; that numerous highly useful precepts and exhortations to virtue are contained in treatises on morals; that theology points out the path to heaven; that philosophy affords the means of discoursing with an appearance of truth on all matters, and commands the admiration of the more simple; that jurisprudence, medicine, and the other sciences, secure for their cultivators honours and riches; and, in fine, that it is useful to bestow some attention upon all, even upon those abounding the most in superstition and error, that we may be in a position to determine their real value, and guard against being deceived.

But I believed that I had already given sufficient time to languages, and likewise to the reading of the writings of the ancients, to their histories and fables. For to hold converse with those of other ages and to travel, are almost the same thing. It is useful to know something of the manners of different nations, that we may be enabled to form a more correct judgment regarding our own, and be prevented from thinking that everything contrary to our customs is ridiculous and irrational, a conclusion usually come to by those whose experience has been limited to their own country. On the other hand, when too much time is occupied in travelling, we become strangers to our native country; and the over curious in the customs of the past are generally ignorant of those of the present. Besides, fictitious narratives lead us to imagine the possibility of many events that are impossible; and even the most faithful histories, if they do not wholly misrepresent matters, or exaggerate their importance to render the account of them more worthy of perusal, omit, at least, almost always the meanest and least striking of the attendant circumstances; hence it happens that the remainder does not represent the truth, and that such as regulate their conduct by examples drawn from this source, are apt to fall into the extravagances of the knight-errants of romance, and to entertain projects that exceed their powers.

I esteemed eloquence highly, and was in raptures with poesy; but I thought that both were gifts of nature rather than fruits of study. Those in whom the faculty of reason is predominant, and who most skillfully dispose their thoughts with a view to render them clear and intelligible, are always the best able to persuade others of the truth of what they lay down, though they should speak only in the language of Lower Brittany, and be wholly ignorant of the rules of rhetoric; and those whose minds are stored with the most agreeable fancies, and who can give expression to them with the greatest embellishment and harmony, are still the best poets, though unacquainted with the art of poetry.

I was especially delighted with the mathematics, on account of the certitude and evidence of their reasonings; but I had not as yet a precise knowledge of their true use; and thinking that they but contributed to the advancement of the mechanical arts, I was astonished that foundations, so strong and solid, should have had no loftier superstructure reared on them. On the other hand, I compared the disquisitions of the ancient moralists to very towering and magnificent palaces with no better foundation than sand and mud: they laud the virtues very highly, and exhibit them as estimable far above anything on earth; but they give us no adequate criterion of virtue, and frequently that which they designate with so fine a name is but apathy, or pride, or despair, or parricide.

I revered our theology, and aspired as much as any one to reach heaven: but being given assuredly to understand that the way is not less open to the most ignorant than to the most learned, and that the revealed truths which lead to heaven are above our comprehension, I did not presume to subject them to the impotency of

my reason; and I thought that in order competently to undertake their examination, there was need of some special help from heaven, and of being more than man.

Of philosophy I will say nothing, except that when I saw that it had been cultivated for many ages by the most distinguished men, and that yet there is not a single matter within its sphere which is not still in dispute, and nothing, therefore, which is above doubt, I did not presume to anticipate that my success would be greater in it than that of others; and further, when I considered the number of conflicting opinions touching a single matter that may be upheld by learned men, while there can be but one true, I reckoned as well-nigh false all that was only probable.

As to the other sciences, inasmuch as these borrow their principles from philosophy, I judged that no solid superstructures could be reared on foundations so infirm; and neither the honour nor the gain held out by them was sufficient to determine me to their cultivation: for I was not, thank Heaven, in a condition which compelled me to make merchandise of science for the bettering of my fortune; and though I might not profess to scorn glory as a cynic, I yet made very slight account of that honour which I hoped to acquire only through fictitious titles. And, in fine, of false sciences I thought I knew the worth sufficiently to escape being deceived by the professions of an alchemist, the predictions of an astrologer, the impostures of a magician, or by the artifices and boasting of any of those who profess to know things of which they are ignorant.

For these reasons, as soon as my age permitted me to pass from under the control of my instructors, I entirely abandoned the study of letters, and resolved no longer to seek any other science than the knowledge of myself, or of the great book of the world. I spent the remainder of my youth in travelling, in visiting courts and armies, in holding intercourse with men of different dispositions and ranks, in collecting varied experience, in proving myself in the different situations into which fortune threw me, and, above all, in making such reflection on the matter of my experience as to secure my improvement. For it occurred to me that I should find much more truth in the reasonings of each individual with reference to the affairs in which he is personally interested, and the issue of which must presently punish him if he has judged amiss, than in those conducted by a man of letters in his study, regarding speculative matters that are of no practical moment, and followed by no consequences to himself, farther, perhaps, than that they foster his vanity the better the more remote they are from common sense; requiring, as they must in this case, the exercise of greater ingenuity and art to render them probable. In addition, I had always a most earnest desire to know how to distinguish the true from the false, in order that I might be able clearly to discriminate the right path in life, and proceed in it with confidence.

It is true that, while busied only in considering the manners of other men, I found here, too, scarce any ground for settled conviction, and remarked hardly less contradiction among them than in the opinions of the philosophers. So that the greatest advantage I derived from the study consisted in this, that, observing many things which, however extravagant and ridiculous to our apprehension, are yet by common consent received and approved by other great nations, I learned to entertain too decided a belief in regard to nothing of the truth of which I had been persuaded merely by example and custom; and thus I gradually extricated myself from many errors powerful enough to darken our natural intelligence, and incapacitate us in great measure from listening to reason. But after I had been occupied several years in thus studying the book of the world, and in essaying to gather some experience, I at length resolved to make myself an object of study, and to employ all the powers of my mind in choosing the paths I ought to follow, an undertaking which was accompanied with greater success than it would have been had I never quitted my country or my books.

Part II

I was then in Germany, attracted thither by the wars in that country, which have not yet been brought to a termination; and as I was returning to the army from the coronation of the emperor, the setting in of winter arrested me in a locality where, as I found no society to interest me, and was besides fortunately undisturbed by any cares or passions, I remained the whole day in seclusion, with full opportunity to occupy my attention with my own thoughts. Of these one of the very first that occurred to me was, that there is seldom so much perfection in works composed of many separate parts, upon which different hands had been employed, as in those completed by a single master. Thus it is observable that the buildings which a single architect has planned and executed, are generally more elegant and commodious than those which several have attempted to improve, by making old walls serve for purposes for which they were not originally built. Thus also, those ancient cities which, from being at first only villages, have become, in course of time, large towns, are usually but ill laid out compared with the regularity constructed towns which a professional architect has freely planned on an open plain; so that although the several buildings of the former may often equal or surpass in beauty those of the latter, yet when one observes their indiscriminate juxtaposition, there a large one and here a small, and the consequent crookedness and irregularity of the streets, one is disposed to allege that chance rather than any human will guided by reason must have led to such an arrangement. And if we consider that nevertheless there have been at all times certain officers whose duty it was to see that private buildings contributed to public ornament, the difficulty of reaching high perfection with but the materials of others to operate on, will be readily

acknowledged. In the same way I fancied that those nations which, starting from a semi-barbarous state and advancing to civilization by slow degrees, have had their laws successively determined, and, as it were, forced upon them simply by experience of the hurtfulness of particular crimes and disputes, would by this process come to be possessed of less perfect institutions than those which, from the commencement of their association as communities, have followed the appointments of some wise legislator. It is thus quite certain that the constitution of the true religion, the ordinances of which are derived from God, must be incomparably superior to that of every other. And, to speak of human affairs, I believe that the pre-eminence of Sparta was due not to the goodness of each of its laws in particular, for many of these were very strange, and even opposed to good morals, but to the circumstance that, originated by a single individual, they all tended to a single end. In the same way I thought that the sciences contained in books (such of them at least as are made up of probable reasonings, without demonstrations), composed as they are of the opinions of many different individuals massed together, are farther removed from truth than the simple inferences which a man of good sense using his natural and unprejudiced judgment draws respecting the matters of his experience. And because we have all to pass through a state of infancy to manhood, and have been of necessity, for a length of time, governed by our desires and preceptors (whose dictates were frequently conflicting, while neither perhaps always counselled us for the best), I farther concluded that it is almost impossible that our judgments can be so correct or solid as they would have been, had our reason been mature from the moment of our birth, and had we always been guided by it alone.

It is true, however, that it is not customary to pull down all the houses of a town with the single design of rebuilding them differently, and thereby rendering the streets more handsome; but it often happens that a private individual takes down his own with the view of erecting it anew, and that people are even sometimes constrained to this when their houses are in danger of falling from age, or when the foundations are insecure. With this before me by way of example, I was persuaded that it would indeed be preposterous for a private individual to think of reforming a state by fundamentally changing it throughout, and overturning it in order to set it up amended; and the same I thought was true of any similar project for reforming the body of the sciences, or the order of teaching them established in the schools: but as for the opinions which up to that time I had embraced, I thought that I could not do better than resolve at once to sweep them wholly away, that I might afterwards be in a position to admit either others more correct, or even perhaps the same when they had undergone the scrutiny of reason. I firmly believed that in this way I should much better succeed in the conduct of my life, than if I built only upon old foundations, and leaned upon principles which, in my youth, I had taken upon trust. For although I recognized various difficulties in this undertaking, these were not, however, without remedy, nor once to be compared with such as attend the slightest reformation in public affairs. Large bodies, if once overthrown, are with great difficulty set up again, or even kept erect when once seriously shaken, and the fall of such is always disastrous. Then if there are any imperfections in the constitutions of states (and that many such exist the diversity of constitutions is alone sufficient to assure us), custom has without doubt materially smoothed their inconveniences, and has even managed to steer altogether clear of, or insensibly corrected a number which sagacity could not have provided against with equal effect; and, in fine, the defects are almost always more tolerable than the change necessary for their removal; in the same manner that highways which wind among mountains, by being much frequented, become gradually so smooth and commodious, that it is much better to follow them than to seek a straighter path by climbing over the tops of rocks and descending to the bottoms of precipices.

Hence it is that I cannot in any degree approve of those restless and busy meddlers who, called neither by birth nor fortune to take part in the management of public affairs, are yet always projecting reforms; and if I thought that this tract contained aught which might justify the suspicion that I was a victim of such folly, I would by no means permit its publication. I have never contemplated anything higher than the reformation of my own opinions, and basing them on a foundation wholly my own. And although my own satisfaction with my work has led me to present here a draft of it, I do not by any means therefore recommend to every one else to make a similar attempt. Those whom God has endowed with a larger measure of genius will entertain, perhaps, designs still more exalted; but for the many I am much afraid lest even the present undertaking be more than they can safely venture to imitate. The single design to strip one's self of all past beliefs is one that ought not to be taken by every one. The majority of men is composed of two classes, for neither of which would this be at all a befitting resolution: in the first place, of those who with more than a due confidence in their own powers, are precipitate in their judgments and want the patience requisite for orderly and circumspect thinking; whence it happens, that if men of this class once take the liberty to doubt of their accustomed opinions, and quit the beaten highway, they will never be able to thread the byway that would lead them by a shorter course, and will lose themselves and continue to wander for life; in the second place, of those who, possessed of sufficient sense or modesty to determine that there are others who excel them in the power of discriminating between truth and error, and by whom they may be instructed, ought rather to content themselves with the opinions of such than trust for more correct to their own reason.

For my own part, I should doubtless have belonged to the latter class, had I received instruction from but one master, or had I never known the diversities of opinion that from time immemorial have prevailed among men of the greatest learning. But I had become aware, even so early as during my college life, that no opinion, however absurd and incredible, can be imagined, which has not been maintained by some one of the philosophers; and afterwards in the course of my travels I remarked that all those whose opinions are decidedly repugnant to ours are not in that account barbarians and savages, but on the contrary that many of these nations make an equally good, if not better, use of their reason than we do. I took into account also the very different character which a person brought up from infancy in France or Germany exhibits, from that which, with the same mind originally, this individual would have possessed had he lived always among the Chinese or with savages, and the circumstance that in dress itself the fashion which pleased us ten years ago, and which may again, perhaps, be received into favor before ten years have gone, appears to us at this moment extravagant and ridiculous. I was thus led to infer that the ground of our opinions is far more custom and example than any certain knowledge. And, finally, although such be the ground of our opinions, I remarked that a plurality of suffrages is no guarantee of truth where it is at all of difficult discovery, as in such cases it is much more likely that it will be found by one than by many. I could, however, select from the crowd no one whose opinions seemed worthy of preference, and thus I found myself constrained, as it were, to use my own reason in the conduct of my life.

But like one walking alone and in the dark, I resolved to proceed so slowly and with such circumspection, that if I did not advance far, I would at least guard against falling. I did not even choose to dismiss summarily any of the opinions that had crept into my belief without having been introduced by reason, but first of all took sufficient time carefully to satisfy myself of the general nature of the task I was setting myself, and ascertain the true method by which to arrive at the knowledge of whatever lay within the compass of my powers.

Among the branches of philosophy, I had, at an earlier period, given some attention to logic, and among those of the mathematics to geometrical analysis and algebra, – three arts or sciences which ought, as I conceived, to contribute something to my design. But, on examination, I found that, as for logic, its syllogisms and the majority of its other precepts are of avail – rather in the communication of what we already know, or even as the art of Lully, in speaking without judgment of things of which we are ignorant, than in the investigation of the unknown; and although this science contains indeed a number of correct and very excellent precepts, there are, nevertheless, so many others, and these either injurious or superfluous, mingled with the former, that it is almost quite as difficult to effect a severance of the true from the false as it is to extract a Diana or a Minerva from a rough block of marble. Then as to the analysis of the ancients and the algebra of the moderns, besides that they embrace only matters highly abstract, and, to appearance, of no use, the former is so exclusively restricted to the consideration of figures, that it can exercise the understanding only on condition of greatly fatiguing the imagination; and, in the latter, there is so complete a subjection to certain rules and formulas, that there results an art full of confusion and obscurity calculated to embarrass, instead of a science fitted to cultivate the mind. By these considerations I was induced to seek some other method which would comprise the advantages of the three and be exempt from their defects. And as a multitude of laws often only hampers justice, so that a state is best governed when, with few laws, these are rigidly administered; in like manner, instead of the great number of precepts of which logic is composed, I believed that the four following would prove perfectly sufficient for me, provided I took the firm and unwavering resolution never in a single instance to fail in observing them.

The first was never to accept anything for true which I did not clearly know to be such; that is to say, carefully to avoid precipitancy and prejudice, and to comprise nothing more in my judgement than what was presented to my mind so clearly and distinctly as to exclude all ground of doubt.

The second, to divide each of the difficulties under examination into as many parts as possible, and as might be necessary for its adequate solution.

The third, to conduct my thoughts in such order that, by commencing with objects the simplest and easiest to know, I might ascend by little and little, and, as it were, step by step, to the knowledge of the more complex; assigning in thought a certain order even to those objects which in their own nature do not stand in a relation of antecedence and sequence.

And the last, in every case to make enumerations so complete, and reviews so general, that I might be assured that nothing was omitted.

The long chains of simple and easy reasonings by means of which geometers are accustomed to reach the conclusions of their most difficult demonstrations, had led me to imagine that all things, to the knowledge of which man is competent, are mutually connected in the same way, and that there is nothing so far removed from us as to be beyond our reach, or so hidden that we cannot discover it, provided only we abstain from accepting the false for the true, and always preserve in our thoughts the order necessary for the deduction of one truth from another. And I had little difficulty in determining the objects with which it was necessary to commence, for I was already persuaded that it must be with the simplest and easiest to know, and, considering that of all those who

have hitherto sought truth in the sciences, the mathematicians alone have been able to find any demonstrations, that is, any certain and evident reasons, I did not doubt but that such must have been the rule of their investigations. I resolved to commence, therefore, with the examination of the simplest objects, not anticipating, however, from this any other advantage than that to be found in accustoming my mind to the love and nourishment of truth, and to a distaste for all such reasonings as were unsound. But I had no intention on that account of attempting to master all the particular sciences commonly denominated mathematics: but observing that, however different their objects, they all agree in considering only the various relations or proportions subsisting among those objects, I thought it best for my purpose to consider these proportions in the most general form possible, without referring them to any objects in particular, except such as would most facilitate the knowledge of them, and without by any means restricting them to these, that afterwards I might thus be the better able to apply them to every other class of objects to which they are legitimately applicable. Perceiving further, that in order to understand these relations I should sometimes have to consider them one by one and sometimes only to bear them in mind, or embrace them in the aggregate, I thought that, in order the better to consider them individually, I should view them as subsisting between straight lines, than which I could find no objects more simple, or capable of being more distinctly represented to my imagination and senses; and on the other hand, that in order to retain them in the memory or embrace an aggregate of many, I should express them by certain characters the briefest possible. In this way I believed that I could borrow all that was best both in geometrical analysis and in algebra, and correct all the defects of the one by help of the other.

And, in point of fact, the accurate observance of these few precepts gave me, I take the liberty of saying, such ease in unravelling all the questions embraced in these two sciences, that in the two or three months I devoted to their examination, not only did I reach solutions of questions I had formerly deemed exceedingly difficult but even as regards questions of the solution of which I continued ignorant, I was enabled, as it appeared to me, to determine the means whereby, and the extent to which a solution was possible; results attributable to the circumstance that I commenced with the simplest and most general truths, and that thus each truth discovered was a rule available in the discovery of subsequent ones. Nor in this perhaps shall I appear too vain, if it be considered that, as the truth on any particular point is one whoever apprehends the truth, knows all that on that point can be known. The child, for example, who has been instructed in the elements of arithmetic, and has made a particular addition, according to rule, may be assured that he has found, with respect to the sum of the numbers before him, and that in this instance is within the reach of human genius. Now, in conclusion, the method which teaches adherence to the true order, and an exact enumeration of all the conditions of the thing sought includes all that gives certitude to the rules of arithmetic.

But the chief ground of my satisfaction with thus method, was the assurance I had of thereby exercising my reason in all matters, if not with absolute perfection, at least with the greatest attainable by me: besides, I was conscious that by its use my mind was becoming gradually habituated to clearer and more distinct conceptions of its objects; and I hoped also, from not having restricted this method to any particular matter, to apply it to the difficulties of the other sciences, with not less success than to those of algebra. I should not, however, on this account have ventured at once on the examination of all the difficulties of the sciences which presented themselves to me, for this would have been contrary to the order prescribed in the method, but observing that the knowledge of such is dependent on principles borrowed from philosophy, in which I found nothing certain, I thought it necessary first of all to endeavour to establish its principles. And because I observed, besides, that an inquiry of this kind was of all others of the greatest moment, and one in which precipitancy and anticipation in judgment were most to be dreaded, I thought that I ought not to approach it till I had reached a more mature age (being at that time but twenty-three), and had first of all employed much of my time in preparation for the work, as well by eradicating from my mind all the erroneous opinions I had up to that moment accepted, as by amassing variety of experience to afford materials for my reasonings, and by continually exercising myself in my chosen method with a view to increased skill in its application.

Part III

And finally, as it is not enough, before commencing to rebuild the house in which we live, that it be pulled down, and materials and builders provided, or that we engage in the work ourselves, according to a plan which we have beforehand carefully drawn out, but as it is likewise necessary that we be furnished with some other house in which we may live commodiously during the operations, so that I might not remain irresolute in my actions, while my reason compelled me to suspend my judgement, and that I might not be prevented from living thenceforward in the greatest possible felicity, I formed a provisory code of morals, composed of three or four maxims, with which I am desirous to make you acquainted.

The first was to obey the laws and customs of my country, adhering firmly to the faith in which, by the grace of God, I had been educated from my childhood and regulating my conduct in every other matter according to the most moderate opinions, and the farthest removed from extremes, which should happen to be adopted in practice with general consent of the most judicious of those among whom I might be living. For as I had from

that time begun to hold my own opinions for nought because I wished to subject them all to examination, I was convinced that I could not do better than follow in the meantime the opinions of the most judicious; and although there are some perhaps among the Persians and Chinese as judicious as among ourselves, expediency seemed to dictate that I should regulate my practice conformably to the opinions of those with whom I should have to live; and it appeared to me that, in order to ascertain the real opinions of such, I ought rather to take cognizance of what they practised than of what they said, not only because, in the corruption of our manners, there are few disposed to speak exactly as they believe, but also because very many are not aware of what it is that they really believe; for, as the act of mind by which a thing is believed is different from that by which we know that we believe it, the one act is often found without the other. Also, amid many opinions held in equal repute, I chose always the most moderate, as much for the reason that these are always the most convenient for practice, and probably the best (for all excess is generally vicious), as that, in the event of my falling into error, I might be at less distance from the truth than if, having chosen one of the extremes, it should turn out to be the other which I ought to have adopted. And I placed in the class of extremes especially all promises by which somewhat of our freedom is abridged; not that I disapproved of the laws which, to provide against the instability of men of feeble resolution, when what is sought to be accomplished is some good, permit engagements by vows and contracts binding the parties to persevere in it, or even, for the security of commerce, sanction similar engagements where the purpose sought to be realized is indifferent: but because I did not find anything on earth which was wholly superior to change, and because, for myself in particular, I hoped gradually to perfect my judgments, and not to suffer them to deteriorate, I would have deemed it a grave sin against good sense, if, for the reason that I approved of something at a particular time, I therefore bound myself to hold it for good at a subsequent time, when perhaps it had ceased to be so, or I had ceased to esteem it such.

My second maxim was to be as firm and resolute in my actions as I was able, and not to adhere less steadfastly to the most doubtful opinions, when once adopted, than if they had been highly certain; imitating in this the example of travellers who, when they have lost their way in a forest, ought not to wander from side to side, far less remain in one place, but proceed constantly towards the same side in as straight a line as possible, without changing their direction for slight reasons, although perhaps it might be chance alone which at first determined the selection; for in this way, if they do not exactly reach the point they desire, they will come at least in the end to some place that will probably be preferable to the middle of a forest. In the same way, since in action it frequently happens that no delay is permissible, it is very certain that, when it is not in our power to determine what is true, we ought to act according to what is most probable; and even although we should not remark a greater probability in one opinion than in another, we ought notwithstanding to choose one or the other, and afterwards consider it, in so far as it relates to practice, as no longer dubious, but manifestly true and certain, since the reason by which our choice has been determined is itself possessed of these qualities. This principle was sufficient thenceforward to rid me of all those repentings and pangs of remorse that usually disturb the consciences of such feeble and uncertain minds as, destitute of any clear and determinate principle of choice, allow themselves one day to adopt a course of action as the best, which they abandon the next, as the opposite.

My third maxim was to endeavour always to conquer myself rather than fortune, and change my desires rather than the order of the world, and in general, accustom myself to the persuasion that, except our own thoughts, there is nothing absolutely in our power; so that when we have done our best in things external to us, all wherein we fail of success is to be held, as regards us, absolutely impossible: and this single principle seemed to me sufficient to prevent me from desiring for the future anything which I could not obtain, and thus render me contented; for since our will naturally seeks those objects alone which the understanding represents as in some way possible of attainment, it is plain, that if we consider all external goods as equally beyond our power, we shall no more regret the absence of such goods as seem due to our birth, when deprived of them without any fault of ours, than our not possessing the kingdoms of China or Mexico, and thus making, so to speak, a virtue of necessity, we shall no more desire health in disease, or freedom in imprisonment, than we now do bodies incorruptible as diamonds, or the wings of birds to fly with. But I confess there is need of prolonged discipline and frequently repeated meditation to accustom the mind to view all objects in this light; and I believe that in this chiefly consisted the secret of the power of such philosophers as in former times were enabled to rise superior to the influence of fortune, and, amid suffering and poverty, enjoy a happiness which their gods might have envied. For, occupied incessantly with the consideration of the limits prescribed to their power by nature, they became so entirely convinced that nothing was at their disposal except their own thoughts, that this conviction was of itself sufficient to prevent their entertaining any desire of other objects; and over their thoughts they acquired a sway so absolute, that they had some ground on this account for esteeming themselves more rich and more powerful, more free and more happy, than other men who, whatever be the favors heaped on them by nature and fortune, if destitute of this philosophy, can never command the realization of all their desires.

In fine, to conclude this code of morals, I thought of reviewing the different occupations of men in this life, with the view of making choice of the best. And, without wishing to offer any remarks on the employments of others, I may state that it was my conviction that I could not do better than continue in that in which I was

engaged, viz., in devoting my whole life to the culture of my reason, and in making the greatest progress I was able in the knowledge of truth, on the principles of the method which I had prescribed to myself. This method, from the time I had begun to apply it, had been to me the source of satisfaction so intense as to lead me to, believe that more perfect or more innocent could not be enjoyed in this life; and as by its means I daily discovered truths that appeared to me of some importance, and of which other men were generally ignorant, the gratification thence arising so occupied my mind that I was wholly indifferent to every other object. Besides, the three preceding maxims were founded singly on the design of continuing the work of self- instruction. For since God has endowed each of us with some light of reason by which to distinguish truth from error, I could not have believed that I ought for a single moment to rest satisfied with the opinions of another, unless I had resolved to exercise my own judgment in examining these whenever I should be duly qualified for the task. Nor could I have proceeded on such opinions without scruple, had I supposed that I should thereby forfeit any advantage for attaining still more accurate, should such exist. And, in fine, I could not have restrained my desires, nor remained satisfied had I not followed a path in which I thought myself certain of attaining all the knowledge to the acquisition of which I was competent, as well as the largest amount of what is truly good which I could ever hope to secure. Inasmuch as we neither seek nor shun any object except in so far as our understanding represents it as good or bad, all that is necessary to right action is right judgment, and to the best action the most correct judgment, that is, to the acquisition of all the virtues with all else that is truly valuable and within our reach; and the assurance of such an acquisition cannot fail to render us contented.

Having thus provided myself with these maxims, and having placed them in reserve along with the truths of faith, which have ever occupied the first place in my belief, I came to the conclusion that I might with freedom set about ridding myself of what remained of my opinions. And, inasmuch as I hoped to be better able successfully to accomplish this work by holding intercourse with mankind, than by remaining longer shut up in the retirement where these thoughts had occurred to me, I betook me again to travelling before the winter was well ended. And, during the nine subsequent years, I did nothing but roam from one place to another, desirous of being a spectator rather than an actor in the plays exhibited on the theatre of the world; and, as I made it my business in each matter to reflect particularly upon what might fairly be doubted and prove a source of error, I gradually rooted out from my mind all the errors which had hitherto crept into it. Not that in this I imitated the sceptics who doubt only that they may doubt, and seek nothing beyond uncertainty itself; for, on the contrary, my design was singly to find ground of assurance, and cast aside the loose earth and sand, that I might reach the rock or the clay. In this, as appears to me, I was successful enough; for, since I endeavoured to discover the falsehood or incertitude of the propositions I examined, not by feeble conjectures, but by clear and certain reasonings, I met with nothing so doubtful as not to yield some conclusion of adequate certainty, although this were merely the inference, that the matter in question contained nothing certain. And, just as in pulling down an old house, we usually reserve the ruins to contribute towards the erection, so, in destroying such of my opinions as I judged to be ill-founded, I made a variety of observations and acquired an amount of experience of which I availed myself in the establishment of more certain. And further, I continued to exercise myself in the method I had prescribed; for, besides taking care in general to conduct all my thoughts according to its rules, I reserved some hours from time to time which I expressly devoted to the employment of the method in the solution of mathematical difficulties, or even in the solution likewise of some questions belonging to other sciences, but which, by my having detached them from such principles of these sciences as were of inadequate certainty, were rendered almost mathematical: the truth of this will be manifest from the numerous examples contained in this volume. And thus, without in appearance living otherwise than those who, with no other occupation than that of spending their lives agreeably and innocently, study to sever pleasure from vice, and who, that they may enjoy their leisure without ennui, have recourse to such pursuits as are honourable, I was nevertheless prosecuting my design, and making greater progress in the knowledge of truth, than I might, perhaps, have made had I been engaged in the perusal of books merely, or in holding converse with men of letters.

These nine years passed away, however, before I had come to any determinate judgment respecting the difficulties which form matter of dispute among the learned, or had commenced to seek the principles of any philosophy more certain than the vulgar. And the examples of many men of the highest genius, who had, in former times, engaged in this inquiry, but, as appeared to me, without success, led me to imagine it to be a work of so much difficulty, that I would not perhaps have ventured on it so soon had I not heard it currently rumoured that I had already completed the inquiry. I know not what were the grounds of this opinion; and, if my conversation contributed in any measure to its rise, this must have happened rather from my having confessed my ignorance with greater freedom than those are accustomed to do who have studied a little, and expounded perhaps, the reasons that led me to doubt of many of those things that by others are esteemed certain, than from my having boasted of any system of philosophy. But, as I am of a disposition that makes me unwilling to be esteemed different from what I really am, I thought it necessary to endeavour by all means to render myself worthy of the reputation accorded to me; and it is now exactly eight years since this desire constrained me to remove from all those places where interruption from any of my acquaintances was possible, and betake myself to this country, in which the long duration of the war has led to the establishment of such discipline, that the

armies maintained seem to be of use only in enabling the inhabitants to enjoy more securely the blessings of peace and where, in the midst of a great crowd actively engaged in business, and more careful of their own affairs than curious about those of others, I have been enabled to live without being deprived of any of the conveniences to be had in the most populous cities, and yet as solitary and as retired as in the midst of the most remote deserts.

Part IV

I am in doubt as to the propriety of making my first meditations in the place above mentioned matter of discourse; for these are so metaphysical, and so uncommon, as not, perhaps, to be acceptable to every one. And yet, that it may be determined whether the foundations that I have laid are sufficiently secure, I find myself in a measure constrained to advert to them. I had long before remarked that, in relation to practice, it is sometimes necessary to adopt, as if above doubt, opinions which we discern to be highly uncertain, as has been already said; but as I then desired to give my attention solely to the search after truth, I thought that a procedure exactly the opposite was called for, and that I ought to reject as absolutely false all opinions in regard to which I could suppose the least ground for doubt, in order to ascertain whether after that there remained aught in my belief that was wholly indubitable. Accordingly, seeing that our senses sometimes deceive us, I was willing to suppose that there existed nothing really such as they presented to us; and because some men err in reasoning, and fall into paralogisms, even on the simplest matters of geometry, I, convinced that I was as open to error as any other, rejected as false all the reasonings I had hitherto taken for demonstrations; and finally, when I considered that the very same thoughts (presentations) which we experience when awake may also be experienced when we are asleep, while there is at that time not one of them true, I supposed that all the objects (presentations) that had ever entered into my mind when awake, had in them no more truth than the illusions of my dreams. But immediately upon this I observed that, whilst I thus wished to think that all was false, it was absolutely necessary that I, who thus thought, should be somewhat; and as I observed that this truth, I think, therefore I am (*cogito ergo sum*), was so certain and of such evidence that no ground of doubt, however extravagant, could be alleged by the sceptics capable of shaking it, I concluded that I might, without scruple, accept it as the first principle of the philosophy of which I was in search.

In the next place, I attentively examined what I was and as I observed that I could suppose that I had no body, and that there was no world nor any place in which I might be; but that I could not therefore suppose that I was not; and that, on the contrary, from the very circumstance that I thought to doubt of the truth of other things, it most clearly and certainly followed that I was; while, on the other hand, if I had only ceased to think, although all the other objects which I had ever imagined had been in reality existent, I would have had no reason to believe that I existed; I thence concluded that I was a substance whose whole essence or nature consists only in thinking, and which, that it may exist, has need of no place, nor is dependent on any material thing; so that "I," that is to say, the mind by which I am what I am, is wholly distinct from the body, and is even more easily known than the latter, and is such, that although the latter were not, it would still continue to be all that it is.

After this I inquired in general into what is essential to the truth and certainty of a proposition; for since I had discovered one which I knew to be true, I thought that I must likewise be able to discover the ground of this certitude. And as I observed that in the words I think, therefore I am, there is nothing at all which gives me assurance of their truth beyond this, that I see very clearly that in order to think it is necessary to exist, I concluded that I might take, as a general rule, the principle, that all the things which we very clearly and distinctly conceive are true, only observing, however, that there is some difficulty in rightly determining the objects which we distinctly conceive.

In the next place, from reflecting on the circumstance that I doubted, and that consequently my being was not wholly perfect (for I clearly saw that it was a greater perfection to know than to doubt), I was led to inquire whence I had learned to think of something more perfect than myself; and I clearly recognized that I must hold this notion from some nature which in reality was more perfect. As for the thoughts of many other objects external to me, as of the sky, the earth, light, heat, and a thousand more, I was less at a loss to know whence these came; for since I remarked in them nothing which seemed to render them superior to myself, I could believe that, if these were true, they were dependencies on my own nature, in so far as it possessed a certain perfection, and, if they were false, that I held them from nothing, that is to say, that they were in me because of a certain imperfection of my nature. But this could not be the case with the idea of a nature more perfect than myself; for to receive it from nothing was a thing manifestly impossible; and, because it is not less repugnant that the more perfect should be an effect of, and dependence on the less perfect, than that something should proceed from nothing, it was equally impossible that I could hold it from myself: accordingly, it but remained that it had been placed in me by a nature which was in reality more perfect than mine, and which even possessed within itself all the perfections of which I could form any idea; that is to say, in a single word, which was God. And to this I added that, since I knew some perfections which I did not possess, I was not the only being in existence (I will here, with your permission, freely use the terms of the schools); but, on the contrary, that there

was of necessity some other more perfect Being upon whom I was dependent, and from whom I had received all that I possessed; for if I had existed alone, and independently of every other being, so as to have had from myself all the perfection, however little, which I actually possessed, I should have been able, for the same reason, to have had from myself the whole remainder of perfection, of the want of which I was conscious, and thus could of myself have become infinite, eternal, immutable, omniscient, all-powerful, and, in fine, have possessed all the perfections which I could recognize in God. For in order to know the nature of God (whose existence has been established by the preceding reasonings), as far as my own nature permitted, I had only to consider in reference to all the properties of which I found in my mind some idea, whether their possession was a mark of perfection; and I was assured that no one which indicated any imperfection was in him, and that none of the rest was wanting. Thus I perceived that doubt, inconstancy, sadness, and such like, could not be found in God, since I myself would have been happy to be free from them. Besides, I had ideas of many sensible and corporeal things; for although I might suppose that I was dreaming, and that all which I saw or imagined was false, I could not, nevertheless, deny that the ideas were in reality in my thoughts. But, because I had already very clearly recognized in myself that the intelligent nature is distinct from the corporeal, and as I observed that all composition is an evidence of dependency, and that a state of dependency is manifestly a state of imperfection, I therefore determined that it could not be a perfection in God to be compounded of these two natures and that consequently he was not so compounded; but that if there were any bodies in the world, or even any intelligences, or other natures that were not wholly perfect, their existence depended on his power in such a way that they could not subsist without him for a single moment.

I was disposed straightway to search for other truths and when I had represented to myself the object of the geometers, which I conceived to be a continuous body or a space indefinitely extended in length, breadth, and height or depth, divisible into divers parts which admit of different figures and sizes, and of being moved or transposed in all manner of ways (for all this the geometers suppose to be in the object they contemplate), I went over some of their simplest demonstrations. And, in the first place, I observed, that the great certitude which by common consent is accorded to these demonstrations, is founded solely upon this, that they are clearly conceived in accordance with the rules I have already laid down. In the next place, I perceived that there was nothing at all in these demonstrations which could assure me of the existence of their object: thus, for example, supposing a triangle to be given, I distinctly perceived that its three angles were necessarily equal to two right angles, but I did not on that account perceive anything which could assure me that any triangle existed: while, on the contrary, recurring to the examination of the idea of a Perfect Being, I found that the existence of the Being was comprised in the idea in the same way that the equality of its three angles to two right angles is comprised in the idea of a triangle, or as in the idea of a sphere, the equidistance of all points on its surface from the centre, or even still more clearly; and that consequently it is at least as certain that God, who is this Perfect Being, is, or exists, as any demonstration of geometry can be.

But the reason which leads many to persuade themselves that there is a difficulty in knowing this truth, and even also in knowing what their mind really is, is that they never raise their thoughts above sensible objects, and are so accustomed to consider nothing except by way of imagination, which is a mode of thinking limited to material objects, that all that is not imaginable seems to them not intelligible. The truth of this is sufficiently manifest from the single circumstance, that the philosophers of the schools accept as a maxim that there is nothing in the understanding which was not previously in the senses, in which however it is certain that the ideas of God and of the soul have never been; and it appears to me that they who make use of their imagination to comprehend these ideas do exactly the same thing as if, in order to hear sounds or smell odours, they strove to avail themselves of their eyes; unless indeed that there is this difference, that the sense of sight does not afford us an inferior assurance to those of smell or hearing; in place of which, neither our imagination nor our senses can give us assurance of anything unless our understanding intervene.

Finally, if there be still persons who are not sufficiently persuaded of the existence of God and of the soul, by the reasons I have adduced, I am desirous that they should know that all the other propositions, of the truth of which they deem themselves perhaps more assured, as that we have a body, and that there exist stars and an earth, and such like, are less certain; for, although we have a moral assurance of these things, which is so strong that there is an appearance of extravagance in doubting of their existence, yet at the same time no-one, unless his intellect is impaired, can deny, when the question relates to a metaphysical certitude, that there is sufficient reason to exclude entire assurance, in the observation that when asleep we can in the same way imagine ourselves possessed of another body and that we see other stars and another earth, when there is nothing of the kind. For how do we know that the thoughts which occur in dreaming are false rather than those other which we experience when awake, since the former are often not less vivid and distinct than the latter? And though men of the highest genius study this question as long as they please, I do not believe that they will be able to give any reason which can be sufficient to remove this doubt, unless they presuppose the existence of God. For, in the first place even the principle which I have already taken as a rule, viz., that all the things which we clearly and distinctly conceive are true, is certain only because God is or exists and because he is a Perfect Being, and

because all that we possess is derived from him: whence it follows that our ideas or notions, which to the extent of their clearness and distinctness are real, and proceed from God, must to that extent be true. Accordingly, whereas we not infrequently have ideas or notions in which some falsity is contained, this can only be the case with such as are to some extent confused and obscure, and in this proceed from nothing (participate of negation), that is, exist in us thus confused because we are not wholly perfect. And it is evident that it is not less repugnant that falsity or imperfection, in so far as it is imperfection, should proceed from God, than that truth or perfection should proceed from nothing. But if we did not know that all which we possess of real and true proceeds from a Perfect and Infinite Being, however clear and distinct our ideas might be, we should have no ground on that account for the assurance that they possessed the perfection of being true.

But after the knowledge of God and of the soul has rendered us certain of this rule, we can easily understand that the truth of the thoughts we experience when awake, ought not in the slightest degree to be called in question on account of the illusions of our dreams. For if it happened that an individual, even when asleep, had some very distinct idea, as, for example, if a geometer should discover some new demonstration, the circumstance of his being asleep would not militate against its truth; and as for the most ordinary error of our dreams, which consists in their representing to us various objects in the same way as our external senses, this is not prejudicial, since it leads us very properly to suspect the truth of the ideas of sense; for we are not infrequently deceived in the same manner when awake; as when persons in the jaundice see all objects yellow, or when the stars or bodies at a great distance appear to us much smaller than they are. For, in fine, whether awake or asleep, we ought never to allow ourselves to be persuaded of the truth of anything unless on the evidence of our reason. And it must be noted that I say of our reason, and not of our imagination or of our senses: thus, for example, although we very clearly see the sun, we ought not therefore to determine that it is only of the size which our sense of sight presents; and we may very distinctly imagine the head of a lion joined to the body of a goat, without being therefore shut up to the conclusion that a chimaera exists; for it is not a dictate of reason that what we thus see or imagine is in reality existent; but it plainly tells us that all our ideas or notions contain in them some truth; for otherwise it could not be that God, who is wholly perfect and veracious, should have placed them in us. And because our reasonings are never so clear or so complete during sleep as when we are awake, although sometimes the acts of our imagination are then as lively and distinct, if not more so than in our waking moments, reason further dictates that, since all our thoughts cannot be true because of our partial imperfection, those possessing truth must infallibly be found in the experience of our waking moments rather than in that of our dreams.

Part V

I would here willingly have proceeded to exhibit the whole chain of truths which I deduced from these primary but as with a view to this it would have been necessary now to treat of many questions in dispute among the learned, with whom I do not wish to be embroiled, I believe that it will be better for me to refrain from this exposition, and only mention in general what these truths are, that the more judicious may be able to determine whether a more special account of them would conduce to the public advantage. I have ever remained firm in my original resolution to suppose no other principle than that of which I have recently availed myself in demonstrating the existence of God and of the soul, and to accept as true nothing that did not appear to me more clear and certain than the demonstrations of the geometers had formerly appeared; and yet I venture to state that not only have I found means to satisfy myself in a short time on all the principal difficulties which are usually treated of in philosophy, but I have also observed certain laws established in nature by God in such a manner, and of which he has impressed on our minds such notions, that after we have reflected sufficiently upon these, we cannot doubt that they are accurately observed in all that exists or takes place in the world and farther, by considering the concatenation of these laws, it appears to me that I have discovered many truths more useful and more important than all I had before learned, or even had expected to learn.

But because I have essayed to expound the chief of these discoveries in a treatise which certain considerations prevent me from publishing, I cannot make the results known more conveniently than by here giving a summary of the contents of this treatise. It was my design to comprise in it all that, before I set myself to write it, I thought I knew of the nature of material objects. But like the painters who, finding themselves unable to represent equally well on a plain surface all the different faces of a solid body, select one of the chief, on which alone they make the light fall, and throwing the rest into the shade, allow them to appear only in so far as they can be seen while looking at the principal one; so, fearing lest I should not be able to compass in my discourse all that was in my mind, I resolved to expound singly, though at considerable length, my opinions regarding light; then to take the opportunity of adding something on the sun and the fixed stars, since light almost wholly proceeds from them; on the heavens since they transmit it; on the planets, comets, and earth, since they reflect it; and particularly on all the bodies that are upon the earth, since they are either coloured, or transparent, or luminous; and finally on man, since he is the spectator of these objects. Further, to enable me to cast this variety of subjects somewhat into the shade, and to express my judgment regarding them with greater freedom, without being necessitated to adopt or refute the opinions of the learned, I resolved to leave all the people here to their disputes,

and to speak only of what would happen in a new world, if God were now to create somewhere in the imaginary spaces matter sufficient to compose one, and were to agitate variously and confusedly the different parts of this matter, so that there resulted a chaos as disordered as the poets ever feigned, and after that did nothing more than lend his ordinary concurrence to nature, and allow her to act in accordance with the laws which he had established. On this supposition, I, in the first place, described this matter, and essayed to represent it in such a manner that to my mind there can be nothing clearer and more intelligible, except what has been recently said regarding God and the soul; for I even expressly supposed that it possessed none of those forms or qualities which are so debated in the schools, nor in general anything the knowledge of which is not so natural to our minds that no-one can so much as imagine himself ignorant of it. Besides, I have pointed out what are the laws of nature; and, with no other principle upon which to found my reasonings except the infinite perfection of God, I endeavoured to demonstrate all those about which there could be any room for doubt, and to prove that they are such, that even if God had created more worlds, there could have been none in which these laws were not observed. Thereafter, I showed how the greatest part of the matter of this chaos must, in accordance with these laws, dispose and arrange itself in such a way as to present the appearance of heavens; how in the meantime some of its parts must compose an earth and some planets and comets, and others a sun and fixed stars. And, making a digression at this stage on the subject of light, I expounded at considerable length what the nature of that light must be which is found in the sun and the stars, and how thence in an instant of time it traverses the immense spaces of the heavens, and how from the planets and comets it is reflected towards the earth. To this I likewise added much respecting the substance, the situation, the motions, and all the different qualities of these heavens and stars; so that I thought I had said enough respecting them to show that there is nothing observable in the heavens or stars of our system that must not, or at least may not appear precisely alike in those of the system which I described. I came next to speak of the earth in particular, and to show how, even though I had expressly supposed that God had given no weight to the matter of which it is composed, this should not prevent all its parts from tending exactly to its centre; how with water and air on its surface, the disposition of the heavens and heavenly bodies, more especially of the moon, must cause a flow and ebb, like in all its circumstances to that observed in our seas, as also a certain current both of water and air from east to west, such as is likewise observed between the tropics; how the mountains, seas, fountains, and rivers might naturally be formed in it, and the metals produced in the mines, and the plants grow in the fields and in general, how all the bodies which are commonly denominated mixed or composite might be generated and, among other things in the discoveries alluded to inasmuch as besides the stars, I knew nothing except fire which produces light, I spared no pains to set forth all that pertains to its nature, – the manner of its production and support, and to explain how heat is sometimes found without light, and light without heat; to show how it can induce various colours upon different bodies and other diverse qualities; how it reduces some to a liquid state and hardens others; how it can consume almost all bodies, or convert them into ashes and smoke; and finally, how from these ashes, by the mere intensity of its action, it forms glass: for as this transmutation of ashes into glass appeared to me as wonderful as any other in nature, I took a special pleasure in describing it. I was not, however, disposed, from these circumstances, to conclude that this world had been created in the manner I described; for it is much more likely that God made it at the first such as it was to be. But this is certain, and an opinion commonly received among theologians, that the action by which he now sustains it is the same with that by which he originally created it; so that even although he had from the beginning given it no other form than that of chaos, provided only he had established certain laws of nature, and had lent it his concurrence to enable it to act as it is wont to do, it may be believed, without discredit to the miracle of creation, that, in this way alone, things purely material might, in course of time, have become such as we observe them at present; and their nature is much more easily conceived when they are beheld coming in this manner gradually into existence, than when they are only considered as produced at once in a finished and perfect state.

From the description of inanimate bodies and plants, I passed to animals, and particularly to man. But since I had not as yet sufficient knowledge to enable me to treat of these in the same manner as of the rest, that is to say, by deducing effects from their causes, and by showing from what elements and in what manner nature must produce them, I remained satisfied with the supposition that God formed the body of man wholly like to one of ours, as well in the external shape of the members as in the internal conformation of the organs, of the same matter with that I had described, and at first placed in it no rational soul, nor any other principle, in room of the vegetative or sensitive soul, beyond kindling in the heart one of those fires without light, such as I had already described, and which I thought was not different from the heat in hay that has been heaped together before it is dry, or that which causes fermentation in new wines before they are run clear of the fruit. For, when I examined the kind of functions which might, as consequences of this supposition, exist in this body, I found precisely all those which may exist in us independently of all power of thinking, and consequently without being in any measure owing to the soul; in other words, to that part of us which is distinct from the body, and of which it has been said above that the nature distinctively consists in thinking, functions in which the animals void of reason may be said wholly to resemble us; but among which I could not discover any of those that, as dependent on thought alone, belong to us as men, while, on the other hand, I did afterwards discover these as soon as I

supposed God to have created a rational soul, and to have annexed it to this body in a particular manner which I described.

But, in order to show how I there handled this matter, I mean here to give the explication of the motion of the heart and arteries, which, as the first and most general motion observed in animals, will afford the means of readily determining what should be thought of all the rest. And that there may be less difficulty in understanding what I am about to say on this subject, I advise those who are not versed in anatomy, before they commence the perusal of these observations, to take the trouble of getting dissected in their presence the heart of some large animal possessed of lungs (for this is throughout sufficiently like the human), and to have shown to them its two ventricles or cavities: in the first place, that in the right side, with which correspond two very ample tubes, viz., the hollow vein (*vena cava*), which is the principal receptacle of the blood, and the trunk of the tree, as it were, of which all the other veins in the body are branches; and the arterial vein (*vena arteriosa*), inappropriately so denominated, since it is in truth only an artery, which, taking its rise in the heart, is divided, after passing out from it, into many branches which presently disperse themselves all over the lungs; in the second place, the cavity in the left side, with which correspond in the same manner two canals in size equal to or larger than the preceding, viz., the venous artery (*arteria venosa*), likewise inappropriately thus designated, because it is simply a vein which comes from the lungs, where it is divided into many branches, interlaced with those of the arterial vein, and those of the tube called the windpipe, through which the air we breathe enters; and the great artery which, issuing from the heart, sends its branches all over the body. I should wish also that such persons were carefully shown the eleven pellicles which, like so many small valves, open and shut the four orifices that are in these two cavities, viz., three at the entrance of the hollow veins where they are disposed in such a manner as by no means to prevent the blood which it contains from flowing into the right ventricle of the heart, and yet exactly to prevent its flowing out; three at the entrance of the arterial vein, which, arranged in a manner exactly the opposite of the former, readily permit the blood contained in this cavity to pass into the lungs, but hinder that contained in the lungs from returning to this cavity; and, in like manner, two others at the mouth of the venous artery, which allow the blood from the lungs to flow into the left cavity of the heart, but preclude its return; and three at the mouth of the great artery, which suffer the blood to flow from the heart, but prevent its reflux. Nor do we need to seek any other reason for the number of these pellicles beyond this that the orifice of the venous artery being of an oval shape from the nature of its situation, can be adequately closed with two, whereas the others being round are more conveniently closed with three. Besides, I wish such persons to observe that the grand artery and the arterial vein are of much harder and firmer texture than the venous artery and the hollow vein; and that the two last expand before entering the heart, and there form, as it were, two pouches denominated the auricles of the heart, which are composed of a substance similar to that of the heart itself; and that there is always more warmth in the heart than in any other part of the body, and finally, that this heat is capable of causing any drop of blood that passes into the cavities rapidly to expand and dilate, just as all liquors do when allowed to fall drop by drop into a highly heated vessel.

For, after these things, it is not necessary for me to say anything more with a view to explain the motion of the heart, except that when its cavities are not full of blood, into these the blood of necessity flows, – from the hollow vein into the right, and from the venous artery into the left; because these two vessels are always full of blood, and their orifices, which are turned towards the heart, cannot then be closed. But as soon as two drops of blood have thus passed, one into each of the cavities, these drops which cannot but be very large, because the orifices through which they pass are wide, and the vessels from which they come full of blood, are immediately rarefied, and dilated by the heat they meet with. In this way they cause the whole heart to expand, and at the same time press home and shut the five small valves that are at the entrances of the two vessels from which they flow, and thus prevent any more blood from coming down into the heart, and becoming more and more rarefied, they push open the six small valves that are in the orifices of the other two vessels, through which they pass out, causing in this way all the branches of the arterial vein and of the grand artery to expand almost simultaneously with the heart which immediately thereafter begins to contract, as do also the arteries, because the blood that has entered them has cooled, and the six small valves close, and the five of the hollow vein and of the venous artery open anew and allow a passage to other two drops of blood, which cause the heart and the arteries again to expand as before. And, because the blood which thus enters into the heart passes through these two pouches called auricles, it thence happens that their motion is the contrary of that of the heart, and that when it expands they contract. But lest those who are ignorant of the force of mathematical demonstrations and who are not accustomed to distinguish true reasons from mere verisimilitudes, should venture, without examination, to deny what has been said, I wish it to be considered that the motion which I have now explained follows as necessarily from the very arrangement of the parts, which may be observed in the heart by the eye alone, and from the heat which may be felt with the fingers, and from the nature of the blood as learned from experience, as does the motion of a clock from the power, the situation, and shape of its counterweights and wheels.

But if it be asked how it happens that the blood in the veins, flowing in this way continually into the heart, is not exhausted, and why the arteries do not become too full, since all the blood which passes through the heart

flows into them, I need only mention in reply what has been written by a physician I of England, who has the honour of having broken the ice on this subject, and of having been the first to teach that there are many small passages at the extremities of the arteries, through which the blood received by them from the heart passes into the small branches of the veins, whence it again returns to the heart; so that its course amounts precisely to a perpetual circulation. Of this we have abundant proof in the ordinary experience of surgeons, who, by binding the arm with a tie of moderate straightness above the part where they open the vein, cause the blood to flow more copiously than it would have done without any ligature; whereas quite the contrary would happen were they to bind it below; that is, between the hand and the opening, or were to make the ligature above the opening very tight. For it is manifest that the tie, moderately straightened, while adequate to hinder the blood already in the arm from returning towards the heart by the veins, cannot on that account prevent new blood from coming forward through the arteries, because these are situated below the veins, and their coverings, from their greater consistency, are more difficult to compress; and also that the blood which comes from the heart tends to pass through them to the hand with greater force than it does to return from the hand to the heart through the veins. And since the latter current escapes from the arm by the opening made in one of the veins, there must of necessity be certain passages below the ligature, that is, towards the extremities of the arm through which it can come thither from the arteries. This physician likewise abundantly establishes what he has advanced respecting the motion of the blood, from the existence of certain pellicles, so disposed in various places along the course of the veins, in the manner of small valves, as not to permit the blood to pass from the middle of the body towards the extremities, but only to return from the extremities to the heart; and farther, from experience which shows that all the blood which is in the body may flow out of it in a very short time through a single artery that has been cut, even although this had been closely tied in the immediate neighbourhood of the heart and cut between the heart and the ligature, so as to prevent the supposition that the blood flowing out of it could come from any other quarter than the heart.

But there are many other circumstances which evince that what I have alleged is the true cause of the motion of the blood: thus, in the first place, the difference that is observed between the blood which flows from the veins, and that from the arteries, can only arise from this, that being rarefied, and, as it were, distilled by passing through the heart, it is thinner, and more vivid, and warmer immediately after leaving the heart, in other words, when in the arteries, than it was a short time before passing into either, in other words, when it was in the veins; and if attention be given, it will be found that this difference is very marked only in the neighbourhood of the heart; and is not so evident in parts more remote from it. In the next place, the consistency of the coats of which the arterial vein and the great artery are composed, sufficiently shows that the blood is impelled against them with more force than against the veins. And why should the left cavity of the heart and the great artery be wider and larger than the right cavity and the arterial vein, were it not that the blood of the venous artery, having only been in the lungs after it has passed through the heart, is thinner, and rarefies more readily, and in a higher degree, than the blood which proceeds immediately from the hollow vein? And what can physicians conjecture from feeling the pulse unless they know that according as the blood changes its nature it can be rarefied by the warmth of the heart, in a higher or lower degree, and more or less quickly than before? And if it be inquired how this heat is communicated to the other members, must it not be admitted that this is effected by means of the blood, which, passing through the heart, is there heated anew, and thence diffused over all the body? Whence it happens, that if the blood be withdrawn from any part, the heat is likewise withdrawn by the same means; and although the heart were as-hot as glowing iron, it would not be capable of warming the feet and hands as at present, unless it continually sent thither new blood. We likewise perceive from this, that the true use of respiration is to bring sufficient fresh air into the lungs, to cause the blood which flows into them from the right ventricle of the heart, where it has been rarefied and, as it were, changed into vapors, to become thick, and to convert it anew into blood, before it flows into the left cavity, without which process it would be unfit for the nourishment of the fire that is there. This receives confirmation from the circumstance, that it is observed of animals destitute of lungs that they have also but one cavity in the heart, and that in children who cannot use them while in the womb, there is a hole through which the blood flows from the hollow vein into the left cavity of the heart, and a tube through which it passes from the arterial vein into the grand artery without passing through the lung. In the next place, how could digestion be carried on in the stomach unless the heart communicated heat to it through the arteries, and along with this certain of the more fluid parts of the blood, which assist in the dissolution of the food that has been taken in? Is not also the operation which converts the juice of food into blood easily comprehended, when it is considered that it is distilled by passing and repassing through the heart perhaps more than one or two hundred times in a day? And what more need be adduced to explain nutrition, and the production of the different humours of the body, beyond saying, that the force with which the blood, in being rarefied, passes from the heart towards the extremities of the arteries, causes certain of its parts to remain in the members at which they arrive, and there occupy the place of some others expelled by them; and that according to the situation, shape, or smallness of the pores with which they meet, some rather than others flow into certain parts, in the same way that some sieves are observed to act, which, by being variously perforated, serve to separate different species of grain? And, in the last place, what above all is here

worthy of observation, is the generation of the animal spirits, which are like a very subtle wind, or rather a very pure and vivid flame which, continually ascending in great abundance from the heart to the brain, thence penetrates through the nerves into the muscles, and gives motion to all the members; so that to account for other parts of the blood which, as most agitated and penetrating, are the fittest to compose these spirits, proceeding towards the brain, it is not necessary to suppose any other cause, than simply, that the arteries which carry them thither proceed from the heart in the most direct lines, and that, according to the rules of mechanics which are the same with those of nature, when many objects tend at once to the same point where there is not sufficient room for all (as is the case with the parts of the blood which flow forth from the left cavity of the heart and tend towards the brain), the weaker and less agitated parts must necessarily be driven aside from that point by the stronger which alone in this way reach it I had expounded all these matters with sufficient minuteness in the treatise which I formerly thought of publishing. And after these, I had shown what must be the fabric of the nerves and muscles of the human body to give the animal spirits contained in it the power to move the members, as when we see heads shortly after they have been struck off still move and bite the earth, although no longer animated; what changes must take place in the brain to produce waking, sleep, and dreams; how light, sounds, odours, tastes, heat, and all the other qualities of external objects impress it with different ideas by means of the senses; how hunger, thirst, and the other internal affections can likewise impress upon it divers ideas; what must be understood by the common sense (*sensus communis*) in which these ideas are received, by the memory which retains them, by the fantasy which can change them in various ways, and out of them compose new ideas, and which, by the same means, distributing the animal spirits through the muscles, can cause the members of such a body to move in as many different ways, and in a manner as suited, whether to the objects that are presented to its senses or to its internal affections, as can take place in our own case apart from the guidance of the will. Nor will this appear at all strange to those who are acquainted with the variety of movements performed by the different automata, or moving machines fabricated by human industry, and that with help of but few pieces compared with the great multitude of bones, muscles, nerves, arteries, veins, and other parts that are found in the body of each animal. Such persons will look upon this body as a machine made by the hands of God, which is incomparably better arranged, and adequate to movements more admirable than is any machine of human invention. And here I specially stayed to show that, were there such machines exactly resembling organs and outward form an ape or any other irrational animal, we could have no means of knowing that they were in any respect of a different nature from these animals; but if there were machines bearing the image of our bodies, and capable of imitating our actions as far as it is morally possible, there would still remain two most certain tests whereby to know that they were not therefore really men. Of these the first is that they could never use words or other signs arranged in such a manner as is competent to us in order to declare our thoughts to others: for we may easily conceive a machine to be so constructed that it emits vocables, and even that it emits some correspondent to the action upon it of external objects which cause a change in its organs; for example, if touched in a particular place it may demand what we wish to say to it; if in another it may cry out that it is hurt, and such like; but not that it should arrange them variously so as appositely to reply to what is said in its presence, as men of the lowest grade of intellect can do. The second test is, that although such machines might execute many things with equal or perhaps greater perfection than any of us, they would, without doubt, fail in certain others from which it could be discovered that they did not act from knowledge, but solely from the disposition of their organs: for while reason is an universal instrument that is alike available on every occasion, these organs, on the contrary, need a particular arrangement for each particular action; whence it must be morally impossible that there should exist in any machine a diversity of organs sufficient to enable it to act in all the occurrences of life, in the way in which our reason enables us to act. Again, by means of these two tests we may likewise know the difference between men and brutes. For it is highly deserving of remark, that there are no men so dull and stupid, not even idiots, as to be incapable of joining together different words, and thereby constructing a declaration by which to make their thoughts understood; and that on the other hand, there is no other animal, however perfect or happily circumstanced, which can do the like. Nor does this inability arise from want of organs: for we observe that magpies and parrots can utter words like ourselves, and are yet unable to speak as we do, that is, so as to show that they understand what they say; in place of which men born deaf and dumb, and thus not less, but rather more than the brutes, destitute of the organs which others use in speaking, are in the habit of spontaneously inventing certain signs by which they discover their thoughts to those who, being usually in their company, have leisure to learn their language. And this proves not only that the brutes have less reason than man, but that they have none at all: for we see that very little is required to enable a person to speak; and since a certain inequality of capacity is observable among animals of the same species, as well as among men, and since some are more capable of being instructed than others, it is incredible that the most perfect ape or parrot of its species, should not in this be equal to the most stupid infant of its kind or at least to one that was crack-brained, unless the soul of brutes were of a nature wholly different from ours. And we ought not to confound speech with the natural movements which indicate the passions, and can be imitated by machines as well as manifested by animals; nor must it be thought with certain of the ancients, that the brutes speak, although we do not understand their language. For if such were the case, since they are endowed with many organs

analogous to ours, they could as easily communicate their thoughts to us as to their fellows. It is also very worthy of remark, that, though there are many animals which manifest more industry than we in certain of their actions, the same animals are yet observed to show none at all in many others: so that the circumstance that they do better than we does not prove that they are endowed with mind, for it would thence follow that they possessed greater reason than any of us, and could surpass us in all things; on the contrary, it rather proves that they are destitute of reason, and that it is nature which acts in them according to the disposition of their organs: thus it is seen, that a clock composed only of wheels and weights can number the hours and measure time more exactly than we with all our skin.

I had after this described the reasonable soul, and shown that it could by no means be educed from the power of matter, as the other things of which I had spoken, but that it must be expressly created; and that it is not sufficient that it be lodged in the human body exactly like a pilot in a ship, unless perhaps to move its members, but that it is necessary for it to be joined and united more closely to the body, in order to have sensations and appetites similar to ours, and thus constitute a real man. I here entered, in conclusion, upon the subject of the soul at considerable length, because it is of the greatest moment: for after the error of those who deny the existence of God, an error which I think I have already sufficiently refuted, there is none that is more powerful in leading feeble minds astray from the straight path of virtue than the supposition that the soul of the brutes is of the same nature with our own; and consequently that after this life we have nothing to hope for or fear, more than flies and ants; in place of which, when we know how far they differ we much better comprehend the reasons which establish that the soul is of a nature wholly independent of the body, and that consequently it is not liable to die with the latter and, finally, because no other causes are observed capable of destroying it, we are naturally led thence to judge that it is immortal.

Part VI

Three years have now elapsed since I finished the treatise containing all these matters; and I was beginning to revise it, with the view to put it into the hands of a printer, when I learned that persons to whom I greatly defer, and whose authority over my actions is hardly less influential than is my own reason over my thoughts, had condemned a certain doctrine in physics, published a short time previously by another individual to which I will not say that I adhered, but only that, previously to their censure I had observed in it nothing which I could imagine to be prejudicial either to religion or to the state, and nothing therefore which would have prevented me from giving expression to it in writing, if reason had persuaded me of its truth; and this led me to fear lest among my own doctrines likewise some one might be found in which I had departed from the truth, notwithstanding the great care I have always taken not to accord belief to new opinions of which I had not the most certain demonstrations, and not to give expression to aught that might tend to the hurt of any one. This has been sufficient to make me alter my purpose of publishing them; for although the reasons by which I had been induced to take this resolution were very strong, yet my inclination, which has always been hostile to writing books, enabled me immediately to discover other considerations sufficient to excuse me for not undertaking the task. And these reasons, on one side and the other, are such that not only is it in some measure my interest here to state them, but that of the public, perhaps, to know them.

I have never made much account of what has proceeded from my own mind; and so long as I gathered no other advantage from the method I employ beyond satisfying myself on some difficulties belonging to the speculative sciences, or endeavouring to regulate my actions according to the principles it taught me, I never thought myself bound to publish anything respecting it. For in what regards manners, everyone is so full of his own wisdom, that there might be found as many reformers as heads, if any were allowed to take upon themselves the task of mending them, except those whom God has constituted the supreme rulers of his people or to whom he has given sufficient grace and zeal to be prophets; and although my speculations greatly pleased myself, I believed that others had theirs, which perhaps pleased them still more. But as soon as I had acquired some general notions respecting physics, and beginning to make trial of them in various particular difficulties, had observed how far they can carry us, and how much they differ from the principles that have been employed up to the present time, I believed that I could not keep them concealed without sinning grievously against the law by which we are bound to promote, as far as in us lies, the general good of mankind. For by them I perceived it to be possible to arrive at knowledge highly useful in life; and in room of the speculative philosophy usually taught in the schools, to discover a practical, by means of which, knowing the force and action of fire, water, air the stars, the heavens, and all the other bodies that surround us, as distinctly as we know the various crafts of our artisans, we might also apply them in the same way to all the uses to which they are adapted, and thus render ourselves the lords and possessors of nature. And this is a result to be desired, not only in order to the invention of an infinity of arts, by which we might be enabled to enjoy without any trouble the fruits of the earth, and all its comforts, but also and especially for the preservation of health, which is without doubt, of all the blessings of this life, the first and fundamental one; for the mind is so intimately dependent upon the condition and relation of the organs of the body, that if any means can ever be found to render men wiser and more ingenious than hitherto, I believe that it is in medicine they must be sought for. It is true that the science of medicine, as it now

exists, contains few things whose utility is very remarkable: but without any wish to depreciate it, I am confident that there is no-one, even among those whose profession it is, who does not admit that all at present known in it is almost nothing in comparison of what remains to be discovered; and that we could free ourselves from an infinity of maladies of body as well as of mind, and perhaps also even from the debility of age, if we had sufficiently ample knowledge of their causes, and of all the remedies provided for us by nature. But since I designed to employ my whole life in the search after so necessary a science, and since I had fallen in with a path which seems to me such, that if anyone follow it he must inevitably reach the end desired, unless he be hindered either by the shortness of life or the want of experiments, I judged that there could be no more effectual provision against these two impediments than if I were faithfully to communicate to the public all the little I might myself have found, and incite men of superior genius to strive to proceed farther, by contributing, each according to his inclination and ability, to the experiments which it would be necessary to make, and also by informing the public of all they might discover, so that, by the last beginning where those before them had left off, and thus connecting the lives and labours of many, we might collectively proceed much farther than each by himself could do.

I remarked, moreover, with respect to experiments, that they become always more necessary the more one is advanced in knowledge; for, at the commencement, it is better to make use only of what is spontaneously presented to our senses, and of which we cannot remain ignorant, provided we bestow on it any reflection, however slight, than to concern ourselves about more uncommon and recondite phenomena: the reason of which is, that the more uncommon often only mislead us so long as the causes of the more ordinary are still unknown; and the circumstances upon which they depend are almost always so special and minute as to be highly difficult to detect. But in this I have adopted the following order: first, I have essayed to find in general the principles, or first causes of all that is or can be in the world, without taking into consideration for this end anything but God himself who has created it, and without educating them from any other source than from certain germs of truths naturally existing in our minds. In the second place, I examined what were the first and most ordinary effects that could be deduced from these causes; and it appears to me that, in this way, I have found heavens, stars, an earth, and even on the earth water, air, fire, minerals, and some other things of this kind, which of all others are the most common and simple, and hence the easiest to know. Afterwards when I wished to descend to the more particular, so many diverse objects presented themselves to me, that I believed it to be impossible for the human mind to distinguish the forms or species of bodies that are upon the earth, from an infinity of others which might have been, if it had pleased God to place them there, or consequently to apply them to our use, unless we rise to causes through their effects, and avail ourselves of many particular experiments. Thereupon, turning over in my mind, the objects that had ever been presented to my senses I freely venture to state that I have never observed any which I could not satisfactorily explain by the principles had discovered. But it is necessary also to confess that the power of nature is so ample and vast, and these principles so simple and general, that I have hardly observed a single particular effect which I cannot at once recognize as capable of being deduced in many different modes from the principles, and that my greatest difficulty usually is to discover in which of these modes the effect is dependent upon them; for out of this difficulty cannot otherwise extricate myself than by again seeking certain experiments, which may be such that their result is not the same, if it is in the one of these modes at we must explain it, as it would be if it were to be explained in the other. As to what remains, I am now in a position to discern, as I think, with sufficient clearness what course must be taken to make the majority those experiments which may conduce to this end: but I perceive likewise that they are such and so numerous, that neither my hands nor my income, though it were a thousand times larger than it is, would be sufficient for them all; so that according as henceforward I shall have the means of making more or fewer experiments, I shall in the same proportion make greater or less progress in the knowledge of nature. This was what I had hoped to make known by the treatise I had written, and so clearly to exhibit the advantage that would thence accrue to the public, as to induce all who have the common good of man at heart, that is, all who are virtuous in truth, and not merely in appearance, or according to opinion, as well to communicate to me the experiments they had already made, as to assist me in those that remain to be made.

But since that time other reasons have occurred to me, by which I have been led to change my opinion, and to think that I ought indeed to go on committing to writing all the results which I deemed of any moment, as soon as I should have tested their truth, and to bestow the same care upon them as I would have done had it been my design to publish them. This course commended itself to me, as well because I thus afforded myself more ample inducement to examine them thoroughly, for doubtless that is always more narrowly scrutinized which we believe will be read by many, than that which is written merely for our private use (and frequently what has seemed to me true when I first conceived it, has appeared false when I have set about committing it to writing), as because I thus lost no opportunity of advancing the interests of the public, as far as in me lay, and since thus likewise, if my writings possess any value, those into whose hands they may fall after my death may be able to put them to what use they deem proper. But I resolved by no means to consent to their publication during my lifetime, lest either the oppositions or the controversies to which they might give rise, or even the reputation, such as it might be, which they would acquire for me, should be any occasion of my losing the time that I had set

apart for my own improvement. For though it be true that everyone is bound to promote to the extent of his ability the good of others, and that to be useful to no-one is really to be worthless, yet it is likewise true that our cares ought to extend beyond the present, and it is good to omit doing what might perhaps bring some profit to the living, when we have in view the accomplishment of other ends that will be of much greater advantage to posterity. And in truth, I am quite willing it should be known that the little I have hitherto learned is almost nothing in comparison with that of which I am ignorant, and to the knowledge of which I do not despair of being able to attain; for it is much the same with those who gradually discover truth in the sciences, as with those who when growing rich find less difficulty in making great acquisitions, than they formerly experienced when poor in making acquisitions of much smaller amount. Or they may be compared to the commanders of armies, whose forces usually increase in proportion to their victories, and who need greater prudence to keep together the residue of their troops after a defeat than after a victory to take towns and provinces. For he truly engages in battle who endeavours to surmount all the difficulties and errors which prevent him from reaching the knowledge of truth, and he is overcome in fight who admits a false opinion touching a matter of any generality and importance, and he requires thereafter much more skill to recover his former position than to make great advances when once in possession of thoroughly ascertained principles. As for myself, if I have succeeded in discovering any truths in the sciences (and I trust that what is contained in this volume I will show that I have found some), I can declare that they are but the consequences and results of five or six principal difficulties which I have surmounted, and my encounters with which I reckoned as battles in which victory declared for me. I will not hesitate even to avow my belief that nothing further is wanting to enable me fully to realize my designs than to gain two or three similar victories; and that I am not so far advanced in years but that, according to the ordinary course of nature, I may still have sufficient leisure for this end. But I conceive myself the more bound to husband the time that remains the greater my expectation of being able to employ it aright, and I should doubtless have much to rob me of it, were I to publish the principles of my physics: for although they are almost all so evident that to assent to them no more is needed than simply to understand them, and although there is not one of them of which I do not expect to be able to give demonstration, yet, as it is impossible that they can be in accordance with all the diverse opinions of others, I foresee that I should frequently be turned aside from my grand design, on occasion of the opposition which they would be sure to awaken.

It may be said, that these oppositions would be useful both in making me aware of my errors, and, if my speculations contain anything of value, in bringing others to a fuller understanding of it; and still farther, as many can see better than one, in leading others who are now beginning to avail themselves of my principles, to assist me in turn with their discoveries. But though I recognize my extreme liability to error, and scarce ever trust to the first thoughts which occur to me, yet the experience I have had of possible objections to my views prevents me from anticipating any profit from them. For I have already had frequent proof of the judgments, as well of those I esteemed friends, as of some others to whom I thought I was an object of indifference, and even of some whose malignancy and envy would, I knew, determine them to endeavour to discover what partiality concealed from the eyes of my friends. But it has rarely happened that anything has been objected to me which I had myself altogether overlooked, unless it were something far removed from the subject: so that I have never met with a single critic of my opinions who did not appear to me either less rigorous or less equitable than myself. And further, I have never observed that any truth before unknown has been brought to light by the disputations that are practised in the schools; for while each strives for the victory, each is much more occupied in making the best of mere verisimilitude, than in weighing the reasons on both sides of the question; and those who have been long good advocates are not afterwards on that account the better judges.

As for the advantage that others would derive from the communication of my thoughts, it could not be very great; because I have not yet so far prosecuted them as that much does not remain to be added before they can be applied to practice. And I think I may say without vanity, that if there is any one who can carry them out that length, it must be myself rather than another: not that there may not be in the world many minds incomparably superior to mine, but because one cannot so well seize a thing and make it one's own, when it has been learned from another, as when one has himself discovered it. And so true is this of the present subject that, though I have often explained some of my opinions to persons of much acuteness, who, whilst I was speaking, appeared to understand them very distinctly, yet, when they repeated them, I have observed that they almost always changed them to such an extent that I could no longer acknowledge them as mine. I am glad, by the way, to take this opportunity of requesting posterity never to believe on hearsay that anything has proceeded from me which has not been published by myself; and I am not at all astonished at the extravagances attributed to those ancient philosophers whose own writings we do not possess; whose thoughts, however, I do not on that account suppose to have been really absurd, seeing they were among the ablest men of their times, but only that these have been falsely represented to us. It is observable, accordingly, that scarcely in a single instance has any one of their disciples surpassed them; and I am quite sure that the most devoted of the present followers of Aristotle would think themselves happy if they had as much knowledge of nature as he possessed, were it even under the condition that they should never afterwards attain to higher. In this respect they are like the ivy which never strives to rise above the tree that sustains it, and which frequently even returns downwards when it has reached

the top; for it seems to me that they also sink, in other words, render themselves less wise than they would be if they gave up study, who, not contented with knowing all that is intelligibly explained in their author, desire in addition to find in him the solution of many difficulties of which he says not a word, and never perhaps so much as thought. Their fashion of philosophizing, however, is well suited to persons whose abilities fall below mediocrity; for the obscurity of the distinctions and principles of which they make use enables them to speak of all things with as much confidence as if they really knew them, and to defend all that they say on any subject against the most subtle and skilful, without its being possible for any one to convict them of error. In this they seem to me to be like a blind man, who, in order to fight on equal terms with a person that sees, should have made him descend to the bottom of an intensely dark cave: and I may say that such persons have an interest in my refraining from publishing the principles of the philosophy of which I make use; for, since these are of a kind the simplest and most evident, I should, by publishing them, do much the same as if I were to throw open the windows, and allow the light of day to enter the cave into which the combatants had descended. But even superior men have no reason for any great anxiety to know these principles, for if what they desire is to be able to speak of all things, and to acquire a reputation for learning, they will gain their end more easily by remaining satisfied with the appearance of truth, which can be found without much difficulty in all sorts of matters, than by seeking the truth itself which unfolds itself but slowly and that only in some departments, while it obliges us, when we have to speak of others, freely to confess our ignorance. If, however, they prefer the knowledge of some few truths to the vanity of appearing ignorant of none, as such knowledge is undoubtedly much to be preferred, and, if they choose to follow a course similar to mine, they do not require for this that I should say anything more than I have already said in this discourse. For if they are capable of making greater advancement than I have made, they will much more be able of themselves to discover all that I believe myself to have found; since as I have never examined aught except in order, it is certain that what yet remains to be discovered is in itself more difficult and recondite, than that which I have already been enabled to find, and the gratification would be much less in learning it from me than in discovering it for themselves. Besides this, the habit which they will acquire, by seeking first what is easy, and then passing onward slowly and step by step to the more difficult, will benefit them more than all my instructions. Thus, in my own case, I am persuaded that if I had been taught from my youth all the truths of which I have since sought out demonstrations, and had thus learned them without labour, I should never, perhaps, have known any beyond these; at least, I should never have acquired the habit and the facility which I think I possess in always discovering new truths in proportion as I give myself to the search. And, in a single word, if there is any work in the world which cannot be so well finished by another as by him who has commenced it, it is that at which I labour.

It is true, indeed, as regards the experiments which may conduce to this end, that one man is not equal to the task of making them all; but yet he can advantageously avail himself, in this work, of no hands besides his own, unless those of artisans, or parties of the same kind, whom he could pay, and whom the hope of gain (a means of great efficacy) might stimulate to accuracy in the performance of what was prescribed to them. For as to those who, through curiosity or a desire of learning, of their own accord, perhaps, offer him their services, besides that in general their promises exceed their performance, and that they sketch out fine designs of which not one is ever realized, they will, without doubt, expect to be compensated for their trouble by the explication of some difficulties, or, at least, by compliments and useless speeches, in which he cannot spend any portion of his time without loss to himself. And as for the experiments that others have already made, even although these parties should be willing of themselves to communicate them to him (which is what those who esteem them secrets will never do), the experiments are, for the most part, accompanied with so many circumstances and superfluous elements, as to make it exceedingly difficult to disentangle the truth from its adjuncts- besides, he will find almost all of them so ill described, or even so false (because those who made them have wished to see in them only such facts as they deemed conformable to their principles), that, if in the entire number there should be some of a nature suited to his purpose, still their value could not compensate for the time what would be necessary to make the selection. So that if there existed any one whom we assuredly knew to be capable of making discoveries of the highest kind, and of the greatest possible utility to the public; and if all other men were therefore eager by all means to assist him in successfully prosecuting his designs, I do not see that they could do aught else for him beyond contributing to defray the expenses of the experiments that might be necessary; and for the rest, prevent his being deprived of his leisure by the unseasonable interruptions of any one. But besides that I neither have so high an opinion of myself as to be willing to make promise of anything extraordinary, nor feed on imaginations so vain as to fancy that the public must be much interested in my designs; I do not, on the other hand, own a soul so mean as to be capable of accepting from any one a favour of which it could be supposed that I was unworthy.

These considerations taken together were the reason why, for the last three years, I have been unwilling to publish the treatise I had on hand, and why I even resolved to give publicity during my life to no other that was so general, or by which the principles of my physics might be understood. But since then, two other reasons have come into operation that have determined me here to subjoin some particular specimens, and give the public some account of my doings and designs. Of these considerations, the first is, that if I failed to do so, many who

were cognizant of my previous intention to publish some writings, might have imagined that the reasons which induced me to refrain from so doing, were less to my credit than they really are; for although I am not immoderately desirous of glory, or even, if I may venture so to say, although I am averse from it in so far as I deem it hostile to repose which I hold in greater account than aught else, yet, at the same time, I have never sought to conceal my actions as if they were crimes, nor made use of many precautions that I might remain unknown; and this partly because I should have thought such a course of conduct a wrong against myself, and partly because it would have occasioned me some sort of uneasiness which would again have been contrary to the perfect mental tranquillity which I court. And forasmuch as, while thus indifferent to the thought alike of fame or of forgetfulness, I have yet been unable to prevent myself from acquiring some sort of reputation, I have thought it incumbent on me to do my best to save myself at least from being ill-spoken of. The other reason that has determined me to commit to writing these specimens of philosophy is, that I am becoming daily more and more alive to the delay which my design of self-instruction suffers, for want of the infinity of experiments I require, and which it is impossible for me to make without the assistance of others: and, without flattering myself so much as to expect the public to take a large share in my interests, I am yet unwilling to be found so far wanting in the duty I owe to myself, as to give occasion to those who shall survive me to make it matter of reproach against me some day, that I might have left them many things in a much more perfect state than I have done, had I not too much neglected to make them aware of the ways in which they could have promoted the accomplishment of my designs.

And I thought that it was easy for me to select some matters which should neither be obnoxious to much controversy, nor should compel me to expound more of my principles than I desired, and which should yet be sufficient clearly to exhibit what I can or cannot accomplish in the sciences. Whether or not I have succeeded in this it is not for me to say; and I do not wish to forestall the judgments of others by speaking myself of my writings; but it will gratify me if they be examined, and, to afford the greater inducement to this I request all who may have any objections to make to them, to take the trouble of forwarding these to my publisher, who will give me notice of them, that I may endeavour to subjoin at the same time my reply; and in this way readers seeing both at once will more easily determine where the truth lies; for I do not engage in any case to make prolix replies, but only with perfect frankness to avow my errors if I am convinced of them, or if I cannot perceive them, simply to state what I think is required for defence of the matters I have written, adding thereto no explication of any new matter that it may not be necessary to pass without end from one thing to another.

If some of the matters of which I have spoken in the beginning of the “Dioptrics” and “Meteorics” should offend at first sight, because I call them hypotheses and seem indifferent about giving proof of them, I request a patient and attentive reading of the whole, from which I hope those hesitating will derive satisfaction; for it appears to me that the reasonings are so mutually connected in these treatises, that, as the last are demonstrated by the first which are their causes, the first are in their turn demonstrated by the last which are their effects. Nor must it be imagined that I here commit the fallacy which the logicians call a circle; for since experience renders the majority of these effects most certain, the causes from which I deduce them do not serve so much to establish their reality as to explain their existence; but on the contrary, the reality of the causes is established by the reality of the effects. Nor have I called them hypotheses with any other end in view except that it may be known that I think I am able to deduce them from those first truths which I have already expounded; and yet that I have expressly determined not to do so, to prevent a certain class of minds from thence taking occasion to build some extravagant philosophy upon what they may take to be my principles, and my being blamed for it. I refer to those who imagine that they can master in a day all that another has taken twenty years to think out, as soon as he has spoken two or three words to them on the subject; or who are the more liable to error and the less capable of perceiving truth in very proportion as they are more subtle and lively. As to the opinions which are truly and wholly mine, I offer no apology for them as new, — persuaded as I am that if their reasons be well considered they will be found to be so simple and so conformed, to common sense as to appear less extraordinary and less paradoxical than any others which can be held on the same subjects; nor do I even boast of being the earliest discoverer of any of them, but only of having adopted them, neither because they had nor because they had not been held by others, but solely because reason has convinced me of their truth.

Though artisans may not be able at once to execute the invention which is explained in the “Dioptrics,” I do not think that any one on that account is entitled to condemn it; for since address and practice are required in order so to make and adjust the machines described by me as not to overlook the smallest particular, I should not be less astonished if they succeeded on the first attempt than if a person were in one day to become an accomplished performer on the guitar, by merely having excellent sheets of music set up before him. And if I write in French, which is the language of my country, in preference to Latin, which is that of my preceptors, it is because I expect that those who make use of their unprejudiced natural reason will be better judges of my opinions than those who give heed to the writings of the ancients only; and as for those who unite good sense with habits of study, whom alone I desire for judges, they will not, I feel assured, be so partial to Latin as to refuse to listen to my reasonings merely because I expound them in the vulgar tongue.

In conclusion, I am unwilling here to say anything very specific of the progress which I expect to make for the future in the sciences, or to bind myself to the public by any promise which I am not certain of being able to fulfil; but this only will I say, that I have resolved to devote what time I may still have to live to no other occupation than that of endeavouring to acquire some knowledge of Nature, which shall be of such a kind as to enable us therefrom to deduce rules in medicine of greater certainty than those at present in use; and that my inclination is so much opposed to all other pursuits, especially to such as cannot be useful to some without being hurtful to others, that if, by any circumstances, I had been constrained to engage in such, I do not believe that I should have been able to succeed. Of this I here make a public declaration, though well aware that it cannot serve to procure for me any consideration in the world, which, however, I do not in the least affect; and I shall always hold myself more obliged to those through whose favour I am permitted to enjoy my retirement without interruption than to any who might offer me the highest earthly preferments.

3. Benedicto Spinoza (1675)

ETHICS

Source: *Ethics* (1677). Everyman Classics, translation by G H R Parkinson, 1989; opening few pages from each of first four parts.

FIRST PART Concerning God

DEFINITIONS

I. By CAUSE OF ITSELF (*causa sui*) I understand that whose essence involves existence; or, that whose nature cannot be conceived except as existing.

II. That thing is said to be FINITE IN ITS KIND (*in suo genere finita*) which can be limited by another thing of the same kind. E.g., a body is said to be finite because we can always conceive another larger than it. Thus a thought is limited by another thought. But a body cannot be limited by a thought, nor a thought by a body.

III. By SUBSTANCE (*substantia*) I understand that which is in itself and is conceived through itself: that is, that, the conception of which does not depend on the conception of another thing, from which conception it must be formed.

IV. By ATTRIBUTE (*attributum*) I understand that which the intellect perceives of substance as constituting its essence.

V. By MODES (*modus*) I understand the Modifications (*affectiones*) of a substance; or, that which is in something else through which it is also conceived.

VI. By God (*Deus*) I understand a being absolutely infinite, that is, a substance consisting of infinite attributes, each of which expresses eternal and infinite essence.

Explanation. - I say absolutely infinite, but not in its kind. For of whatever is infinite only in its kind, we can deny infinite attributes; but to the essence of what is absolutely infinite there appertains whatever expresses essence and involves no negation.

VII. That thing is said to be FREE (*libera*) which exists by the mere necessity of its own nature and is determined to act by itself alone. That thing is said to be NECESSARY (*necessaria*), or rather COMPELLED (*coacta*), which is determined by something else to exist and act in a certain fixed and determinate way.

VIII. I understand ETERNITY (*aeternitas*) to be existence itself, in so far as it is conceived to follow necessarily from the mere definition of an eternal thing.

Explanation.- For such existence is conceived as an eternal truth, just as is the essence of a thing, and therefore cannot be explained by duration or time, even though the duration is conceived as wanting beginning and end.

AXIOMS

I. All things which exist, exist either in themselves or in something else.

II. That which cannot be conceived through another thing must be conceived through itself.

III. From a given determinate cause an effect follows of necessity, and on the other hand, if no determinate cause exists, it is impossible that an effect should follow.

IV. The knowledge of an effect depends on the knowledge of the cause, and involves it.

V. Things which have nothing in common reciprocally cannot be comprehended reciprocally through each other, or, the conception of the one does not involve the conception of the other.

VI. A true ideal must agree with that of which it is the idea (*ideatum*).

VII. The essence of that which can be conceived as not existing does not involve existence.

PROPOSITIONS

PROP. I. A substance is prior in nature to its modifications.

Proof.- This is obvious from Def. 3 and 5.

PROP. II. Two substances, having different attributes, have nothing in common between them.

Proof.- This also is obvious from Def. 3. For each of them must be in itself and be conceived through itself, or, the conception of one of them does not involve the conception of the other.

PROP. III. Of two things having nothing in common between them, one cannot be the cause of the other.

Proof.- If they have nothing in common reciprocally, it follows that (Ax. 5) they cannot be understood through each other, and therefore (Ax. 4) one cannot be the cause of the other. *Q.e.d.*

PROP. IV. Two or more distinct things are distinguished one from the other either by the difference of the attributes of substances or by the difference of their modifications.

Proof.- All things that exist, exist either in themselves or in something else (Ax. I), that is (Def. 3 and 5), outside the intellect nothing exists save substances and their modifications. Nothing therefore exists outside the intellect, through which several things may be distinguished one from the other except substances, or, what is the same thing (Def. 4), their attributes and modifications. *Q.e.d.*

PROP. V. There cannot exist in the universe two or more substances of the same nature or attribute.

Proof.- If several distinct substances exist, they must be distinguished one from the other either by the difference of their attributes or by the difference of their modifications (prev. Prop.). If, then, they are to be distinguished by the difference of their attributes alone, it is granted that there exists only one substance of the same attribute. But if they are to be distinguished by the difference of their modifications, then since a substance is prior in nature to its modifications (Prop. I), let the modifications be laid aside and let the substance be considered in itself, that is (Def. 3 and 6), truly considered; it could not then be conceived as distinguished from another, that is (prev. Prop.), two or more substances cannot have the same nature or attribute. *Q.e.d.*

PROP. VI. One substance cannot be produced by another.

Proof. - There cannot exist in the universe two substances of the same attribute (prev. Prop.), that is (Prop. 2), which have anything in common, and accordingly (Prop. 3) one of them cannot be the cause of the other or one cannot be produced by the other. *Q.e.d.*

Corollary. - Hence it follows that a substance cannot be produced from anything else. For there exists in the universe nothing save substances and their modifications, as is obvious from Ax. I and Def. 3 and 5: and it cannot be produced from another substance (prev. Prop.). Therefore a substance cannot be produced from anything else whatsoever. *Q.e.d.*

Another Proof. - This can be more easily shown by the method of proving the contrary to be absurd. For if a substance can be produced from anything else, the knowledge of it should depend on the knowledge of its cause (Ax. 4), and consequently (Def. 3) it would not be a substance.

PROP. VII. Existence appertains to the nature of substance.

Proof. - A substance cannot be produced from anything else (prev. Prop., Coroll.): it will therefore be its own cause, that is (Def. 1), its essence necessarily involves existence, or, existence appertains to its nature. *Q.e.d.*

PROP. VIII. Every substance is necessarily infinite.

Proof. - A substance of one attribute exists uniquely (Prop. 5), and it appertains to the nature of substance that it should exist (Prop. 7). It will therefore be of its nature to exist either finitely or infinitely. But not finitely. For (Def. 2) it would then be limited by some other substance of the same nature which also of necessity must exist (Prop. 7): and then two substances would exist having the same attribute, which is absurd (Prop. 5). It will exist, therefore, infinitely. *Q.e.d.*

Note I. - As to be finite is, in reality, a denial in part, and to be infinite is the absolute assertion of the existence of some nature, it follows, therefore (from Prop. 7 alone), that every substance must be infinite.

Note II. - I do not doubt that all those who judge about things in a confused way and are not wont to examine them through their first causes, may find it difficult to understand the proof of the seventh Proposition; doubtless because they do not distinguish between the modifications of substances and the substances themselves, and do not know in what manner things are produced. Hence it comes about that they apply the principle which they see in natural things to substances. For those who do not know the real causes of things confuse everything, and without the least mental repugnance they picture trees no less than men as speaking, and imagine men to be formed from stones no less than from seed, and any forms to be changed into any other forms whatsoever. So also those who confuse divine with human nature easily attribute human passions to God, more especially if they do not know how passions are produced in the mind. But if men would give heed to the nature of substance they would by no means doubt Prop. 7: rather it would be counted as an axiom by all, and included in the common notions. For then by substance they would understand that which is in itself, and through itself is conceived, that is, that the knowledge of which does not depend on the knowledge of any other thing; but by modification that which is in something else, and whose conception is formed from the conception of whatever it is in. Wherefore we may have true ideas of modifications which do not exist: since although they do not actually exist outside the mind, yet their essence is comprehended in something else, in such a way that it can be conceived through it. But the truth of substances does not exist outside the mind unless it exists in themselves, because through themselves they are conceived. If any one should say, then, that he has a clear and distinct, that is a true, idea of substance,

and should nevertheless doubt whether such substance existed, he would indeed be like one who should say that he had a true idea and yet should wonder whether it were false (as will be manifest to any one who regards it carefully); or if any one should say that substance was created, he would state at the same time that a false idea had been made true, than which it is difficult to conceive anything more absurd. And therefore it must necessarily be acknowledged that the existence of substance, like its essence, is an eternal truth. And hence we may conclude in another manner that there cannot be two substances of the same nature: which it is now perhaps worth while to show. But let me arrange this in its proper order, therefore note: (1) the true definition of each thing involves nothing and expresses nothing but the nature of the thing defined. From which it follows (2) that clearly no definition involves any certain number of individuals nor expresses it, since the definition expresses nothing else than the nature of the thing defined. E.g., the definition of a triangle expresses nothing else than the simple nature of a triangle, but not a certain number of triangles. Let it be noted again (3) that for each existing thing there must be a cause by reason of which it exists. Note, moreover, that this cause, by reason of which something exists, must either be contained in the very nature and definition of an existing thing (clearly because it appertains to its nature to exist), or must exist outside itself. This granted, it follows that if a certain number of individuals exist in nature a cause must necessarily exist why those individuals, and not more or fewer, exist. E.g., if in the nature of things twenty men were to exist (whom for the sake of better explanation I will say to have existed at the same time, and that none existed before them), it would not be enough when giving a reason why twenty men existed, to show the cause of human nature in general, but it would be necessary also to show the cause why not more nor less than twenty existed: since (Note 3) a reason or cause should be given why each thing existed. But this cause cannot be contained in human nature itself (Notes 2 and 3), since the true definition of man does not involve the number twenty. Hence (Note 4) the reason why these twenty men exist, and consequently why each of them exists, must necessarily exist outside each one of them: and therefore it must be absolutely concluded that everything which is such that several individuals of that nature can exist must of necessity have an external cause if they are to exist. Now since, as has been shown already in this Note, existence appertains to the nature of substance, its definition must involve necessary existence, and therefore from its mere definition its existence can be concluded. But since, in Notes 2 and 3, we have shown that from its own definition the existence of several substances cannot follow, it follows necessarily therefore that only one substance of the same nature can exist, as we asserted.

PROP. IX. The more reality or being a thing has, the more attributes belong to it.

Proof. - This is obvious from Def. 4.

PROP. X. Each attribute of one substance must be conceived through itself.

Proof. - An attribute is that which the intellect perceives of a substance as constituting its essence (Def. 4), therefore (Def. 3) it must be conceived through itself. *Q.e.d.*

Note. - Hence it is manifest that, although two attributes are conceived as really distinct, that is, one is conceived without the aid of the other, we cannot thence conclude that they constitute two beings, or, two different substances. For it is of the nature of a substance that each of its attributes is conceived through itself: since all the attributes it has were always in it at the same time, nor could one of them be produced from another, but each of them expresses the reality or being of the substance. Therefore it is far from absurd to attribute several attributes to one substance; but on the contrary, nothing is more clear than that each entity must be conceived under some attribute, and the more reality or being it has, the more attributes it has which express both necessity or eternity and infinity; so that nothing can be clearer than that an absolutely infinite being must be defined (as we defined it in Def. 6), as a being which consists of infinite attributes, each of which expresses a certain eternal and infinite essence. But if any one still asks by what sign we shall be able to know the difference of substances, let him read the following Propositions, which will show that in the universe only one substance exists, and that is absolutely infinite, wherefore he will ask for that sign in vain.

PROP. XI. God or a substance consisting of infinite attributes, each of which expresses eternal and infinite essence, necessarily exists.

Proof. - If you deny it, conceive, if it be possible, that God does not exist. Then (Ax. 7) his essence does not involve existence. But this (Prop. 7) is absurd. Therefore God necessarily exists. *Q.e.d.*

Another Proof.- A cause or reason must be assigned for each thing, why it exists or why it does not. E.g., if a triangle exists, there must be a reason or cause why it exists; but if it does not exist, there must also be a reason or cause which prevents it from existing, or, which negates its existence. Now this reason or cause must be contained in the nature of the thing or outside of it. E.g., the reason why a square circle does not exist is shown by the very nature of the circle - namely, because it involves a contradiction. On the other hand, the existence of substance follows from its nature alone, for that involves existence (see Prop. 7). But the reason why a circle or triangle exists, or why it does not exist, does not follow from their nature, but from the order of universal corporeal nature. For from this it must follow either that a triangle necessarily exists or that it is impossible that it

can now exist. But these matters are manifest of themselves. From which it follows that that must of necessity exist for which no reason or cause exists which could prevent its existence. If therefore no reason or cause can exist which prevents the existence of God or negates his existence, it must certainly be concluded that he does exist of necessity. But if such a reason or cause does exist, it must exist either in the nature of God itself or outside of it, that is, in another substance of another nature. For if it were of the same nature, thereby it would be admitted that God exists. But a substance of another nature has nothing in common with God (Prop. 2), and therefore can neither posit his existence nor negate it. And since the reason or cause which would negate God's existence cannot exist outside the divine nature it must of necessity then exist, if indeed God does not exist, in his own nature, which nature would therefore involve a contradiction. But to assert this of a being absolutely infinite and supremely perfect is absurd: therefore neither within God nor without him is there any cause or reason which could negate his existence, and consequently God must necessarily exist. *Q. e. d.*

Another Proof. - To be able not to exist is want of power, and on the other hand, to be able to exist is power (as is self-evident). If then that which now necessarily exists consists only of finite things, hence finite things are more powerful than a being absolutely infinite; and this, as is self-evident, is absurd. Therefore, either nothing exists, or a being absolutely infinite necessarily exists. But we ourselves exist, either in ourselves or in something else which exists of necessity, (see Ax. X and Prop. 7). Therefore a being absolutely infinite, that is (Def. 6) God, necessarily exists. *Q. e. d.*

Note. - In this last proof, I wished to show the existence of God a posteriori so that it might the more easily be perceived, and not because the existence of God does not follow a priori from the same basis of argument. For since ability to exist is power, it follows that the more reality belongs to the nature of some thing, the more power it will have to exist; and accordingly a being absolutely infinite, or God, has an absolutely infinite power of existence from itself, and on that account absolutely exists. Many, however, perhaps will not be able to see the truth of this proof easily, because they are accustomed to consider only those things which flow from external causes and of these, those which are quickly made, that is, which exist easily, they see perish easily; and on the other hand, they judge those things to be harder to make, i.e., not existing so easily, to which they think more features belong. But, to deliver them from these prejudices I need not show here in what respect this statement, 'that which is quickly made perishes speedily', is true, nor even whether, with respect to the whole of nature, all things are equally difficult or not; but it suffices to note that I do not speak here of things which are made from external causes, but of substances alone which (Prop. 6) cannot be produced from any external cause. For those things which are produced by external causes, whether they consist of many parts or few, whatever perfection or reality they have, it is all due to the power of their external cause, and therefore their existence arises merely from the perfection of some external cause and not their own. On the other hand, whatever perfection a substance may have is due to no external cause, wherefore its existence must follow from its nature alone, which is nothing else than its essence. Perfection, then, does not negate a thing's existence, but on the contrary, posits it; but imperfection, on the other hand, negates it, and so we cannot be more certain of the existence of anything than of the existence of a being absolutely infinite or perfect, that is, God. For since his essence excludes all imperfection and involves absolute perfection, by that very fact it removes all cause of doubt concerning his existence and makes it most certain: which will be manifest, I think, to such as pay it the least attention.

PROP. XII. NO attribute of a substance can be truly conceived, from which it would follow that substance can be divided.

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SECOND PART Concerning the nature and origin of the mind

PREFACE

I NOW pass on to explain such things as must follow from the essence of God, or, of a being eternal and infinite: not all of them indeed (for infinite things in infinite ways must follow from that essence, as we have shown in Part I., Prop. 16), but only such as can lead us by the hand (so to speak) to the knowledge of the human mind and its consummate blessedness.

DEFINITIONS

I. BY BODY (*corpus*) I understand a mode which expresses in a certain and determinate manner the essence of God in so far as he is considered as an extended thing (see Part I., Prop. 25)

II. I say that that appertains to the essence of a thing which, when granted, the thing itself is necessarily posited, and which, when negated, the thing is necessarily negated; or that without which the thing, or on the other hand, which without the thing can neither exist nor be conceived.

III. BY IDEA (*idea*) I understand a conception of the mind which the mind forms by reason of its being a thinking thing.

Explanation. - I say conception rather than perception, for the name perception seems to indicate that the mind is passive in relation to the object, while conception seems to express an action of the mind.

IV. BY ADEQUATE IDEA (*idea adaequata*) I understand an idea which, if it is considered in itself without relation to the object, has all the properties or intrinsic denominations of a true notion. - I say intrinsic in order that I may exclude what is extrinsic, i.e., the agreement between the idea and that of which it is the idea.

V. DURATION (*duratio*) is indefinite continuation of existing.

Explanation. - I say indefinite because it can in no wise be determined by means of the nature itself of an existing thing nor again by an efficient cause, which necessarily posits the existence of a thing but does not negate it.

VI. REALITY and PERFECTION (*realitas et perfectio*) I understand to be the same.

VII. BY PARTICULAR THINGS (*res singulares*) I understand things which are finite and have a determinate existence; but if several of them so concur in one action that they all are at the same time the cause of one effect, I consider them all thus far as one particular thing.

AXIOMS

I. The essence of man does not involve necessary existence, that is, in the order of nature it can equally happen that this or that man exists as that he does not exist.

II. Man thinks.

III. The modes of thinking, such as love, desire, or whatever notions of the mind are distinguished by name, do not exist unless an idea in the same individual exists of the thing loved, Fired, etc. But an idea can exist although no other mode of thinking exists.

IV. We sense that a certain body is affected in many ways.

V. We neither sense nor perceive any particular things save bodies and modes of thinking. For Postulates, see after Prop. 13.

PROPOSITIONS

PROP. I. Thought (*cogitatio*) is an attribute of God, or, God is a thinking thing.

Proof. - Particular thoughts, or, this and that thought, are modes which express in a certain and determinate way the nature of God (Coroll., Prop. 25, Part I.). So the attribute whose conception all particular thoughts involve and through which they are conceived, belongs to God (Def. 5, Part I.). Thought, therefore, is one of the infinite attributes of God, which expresses the eternal and infinite essence of God (see Def. 6, Part I.), or God is a thinking thing. *Q.e.d.*

Note. - This proposition is also clear from the fact that we can conceive an infinite thinking being. For the more a thinking being can think, the more reality or perfection we conceive it to have. Therefore a being which can think infinite things in infinite ways is necessarily, by virtue of thinking, infinite. Since, therefore, from the mere consideration of thought we can conceive an infinite being, therefore necessarily (Defs. 4 and 6, Part I.) thought is one of the infinite attributes of God, as we wished to prove.

PROP. II. Extension (*extensio*) is an attribute of God, or God is an extended thing.

Proof. - This proof proceeds in the same manner as that of the previous proposition.

PROP. III. In God there necessarily exists not only the idea of his essence, but also the idea of all the things which follow necessarily from his essence.

Proof. - God can think infinite things in infinite ways (Prop. I, Part II.), or (what is the same thing, by Prop. 16, Part I.) he can form an idea of his essence and of all things which follow necessarily from it. Now all that is in the power of God necessarily exists (Prop. 35, Part I.). Therefore there exists such an idea, and that only in God (Prop. 15, Part I.). *Q.e.d.*

Note. - The generality of people understand by the power of God the free will of God and his right over all things that are, and so these are commonly considered contingent. For they say that God has the power of destroying everything and reducing it to nothing. Moreover, they very often compare the power of God to that of kings. But this in Coroll. 1 and 2, Prop. 32, Part I., we have refuted; and in Prop. 16, Part I., we showed that God acts by the same necessity by which he understands himself: that is, it follows from the necessity of the divine nature (as all grant unanimously) that God understands himself, and from the same necessity it follows that God performs infinite things in infinite ways. Again, in Prop. 34, Part I., we showed that the power of God is nothing else than the actual essence of God: and accordingly it is as impossible for us to conceive God inactive as to conceive him non-existent. And if I may pursue this subject further, I could furthermore point out that the power which the

generality attribute to God is not only human power (showing that they conceive God to be a man or like to one), but also involves want of power. But I do not wish to return to this subject so many times. I only ask the reader again and again to turn over in his mind once and again what I have written on this subject in Part I., from Prop. 16 to the end. For no one can rightly perceive what I wish to point out unless he takes the greatest care not to confound the Power of God with the human power or right of kings.

PROP. IV. The idea of God from which infinite things in infinite ways follow can only be one.

Proof. - Infinite intellect comprehends nothing save the attributes and modifications of God (Prop. 30, Part I.). God is one (Coroll. I, Prop. 14, Part I.). Therefore the idea of God from which infinite things in infinite ways follow can only be one. *Q.e.d.*

PROP. V. The formal being of ideas acknowledges God as its cause only in so far as he is considered as a thinking thing, and not in so far as he is explained by some other attribute: that is, the ideas, not only of the attributes of God, but also of particular things, do not acknowledge those things of which they are the ideas, i.e., the objects perceived as their efficient cause, but God himself in so far as he is a thinking thing.

Proof.- This is obvious from Prop. 3 of this part. For there we concluded that God can form an idea of his essence and of all things which follow therefrom necessarily from the mere fact that he is a thinking thing, and not from the fact that he is the object of his idea. Wherefore the formal being of ideas acknowledges God for its cause in so far as he is a thinking thing. But this can be shown in another manner. The formal being of ideas is a mode of thinking (as is self-evident), that is (Coroll., Prop. 25, Part I.), a mode which expresses in a certain manner the nature of God in so far as he is a thinking thing, and therefore (Prop. 10, Part I.) involves the conception of no other attribute of God, and consequently (Ax. 4, Part I.) is the effect of no other attribute but thought. Therefore the formal being of ideas acknowledges God as its cause only in so far as he is a thinking thing, etc. *Q.e.d.*

PROP. VI. The modes of any attribute of God have God for their cause only in so far as he is considered through that attribute, and not in so far as he is considered through any other attribute.

Proof. - Each attribute is conceived through itself without the aid of another (Prop. 10, Part I.). Wherefore the modes of each attribute involve the conception of their attribute and not that of another; and so (Ax. 4, Part I.) the modes of any attribute of God have God for their cause only in so far as he is considered through that attribute, and not in so far as he is considered through any other attribute. *Q.e.d.*

Corollary. - Hence it follows that the formal being of things which are not modes of thinking does not follow from the divine nature because it has first known the things; but the things of which we have ideas follow and are concluded from their attributes in the same manner and by the same necessity as we have shown ideas to follow from their attribute of thought.

PROP. VII. The order and connection of ideas is the same as the order and connection of things.

Proof. - This is clear from Ax. 4, Part I. For the idea of everything that is caused depends on the knowledge of the cause of which it is an effect.

Corollary. - Hence it follows that God's power of thinking is equal to his actual power of acting: that is, whatever follows formally from the infinite nature of God, follows also invariably objectively from the idea of God in the same order and connection, in God.

Note. - Before we proceed further, let us call to mind what we have already shown above: that whatever can be perceived by infinite intellect as constituting the essence of substance, appertains to one substance alone; and consequently thinking substance and extended substance are one and the same substance, which is now comprehended through this and now through that attribute. Thus also a mode of extension and the idea of that mode are one and the same thing, but expressed in two ways, which certain of the Jews seem to have perceived indistinctly, for they said that God and his intellect and the things conceived by his intellect are one and the same thing. For example, a circle existing in nature and the idea of an existing circle which is also in God is one and the same thing, though explained through different attributes. And thus whether we consider nature under the attribute of extension or under the attribute of thought or under any other attribute, we shall find one and the same order and one and the same connection of causes: that is, the same things follow reciprocally. Nor did I say that God is the cause of (e.g.) an idea of a circle only in so far as he is a thinking thing, and of a circle only in so far as he is an extended thing, for any other reason than that the formal being of the idea of a circle can only be perceived through some other mode of thinking as its proximate cause, and that again through another, and so on to infinity: so that as long as things are considered as modes of thinking we must explain by the mere attribute of thought the order of the whole of nature or, the connection of causes; and in so far as things are considered as modes of extension, the order also of the whole of nature must be explained through the mere attribute of extension; and I understand the same of other attributes. Wherefore of things as they are in themselves, God is in truth the cause, forasmuch as he consists of infinite attributes; nor can I explain this more clearly at present.

PROP. VIII. The ideas of particular things (i.e. modes) which do not exist must be comprehended in the infinite idea of God in the same way as the formal essences of particular things (modes) are contained in the attributes of God.

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THIRD PART

Concerning the origin and nature of the emotions

MOST who have written on the emotions and on the manner of human life, seem to have dealt not with natural things which follow the universal laws of nature, but with things which are outside the sphere of nature: they seem to have conceived man in nature as a kingdom within a kingdom. For they believe that man disturbs rather than follows the order of nature, and that he has absolute power over his actions, and is not determined by anything else than himself. They then attribute the cause of human weakness and inconstancy not to the universal power of nature, but to some defect or other in human nature, wherefore they deplore, ridicule, despise, or, what is most common of all, abuse it: and he that can carp in the most eloquent or acute manner at the weakness of the human mind is held by his fellows as almost divine. Yet excellent men have not been wanting (to whose labour and industry I feel myself much indebted) who have written excellently in great quantity on the right manner of life, and left to men counsels full of wisdom: yet no one has yet determined, as far as I know, the nature and force of the emotions and what the mind can do in opposition to them for their constraint. I know that the most illustrious Descartes, although he also believed that the human mind had absolute power over its actions, endeavoured to explain the human emotions through their first causes, and to show at the same time the way in which the mind could have complete control over the emotions: but, in my opinion, he showed nothing but the greatness and ingenuity of his intellect, as I shall show in its proper place. For I wish to revert to those who prefer rather to abuse and ridicule the emotions and actions of men than to understand them. It will doubtless seem most strange to these that I should attempt to treat on the vices and failings of men in a geometrical manner, and should wish to demonstrate with sure reasoning those things which they cry out against as opposed to reason, as vain, absurd, and disgusting. My argument, however, is this. Nothing happens in nature which can be attributed to a defect of it: for nature is always the same, and its virtue and power of acting is everywhere one and the same, that is, the laws and rules of nature according to which all things are made and changed from one form into another, are everywhere and always the same, and therefore there must be one and the same way of understanding the nature of all things, that is, by means of the universal laws and rules of nature. Therefore such emotions as hate, anger, envy, etc., considered in themselves, follow from the same necessity and virtue of nature as other particular things: and therefore they acknowledge certain causes through which they are understood, and have certain properties equally worthy of our knowledge as the properties of any other thing, the contemplation alone of which delights us. And so I shall treat of the nature and force of the emotions, and the power of the mind over them, in the same manner as I treated of God and the mind in the previous parts, and I shall regard human actions and appetites exactly as if I were dealing with lines, planes, and bodies.

DEFINITIONS

I. I call that an ADEQUATE CAUSE (*adaequata causa*) whose effect can clearly and distinctly be perceived through it. I call that one INADEQUATE or PARTIAL (*inadaequata seu partialis*) whose effect cannot be perceived through itself alone.

II. I say that we ACT when something takes place within us or outside of us whose adequate cause we are, that is (prev. Def.), when from our nature anything follows in us or outside us which can be clearly and distinctly understood through that nature alone. On the other hand, I say we are PASSIVE (*pati*) when something takes place in us or follows from our nature of which we are only the partial cause.

III. By EMOTION (*affectus*) I understand the modifications of the body by which the power of action of the body is increased or diminished, aided or restrained, and at the same time the ideas of these modifications.

Explanation. - Thus if we can be the adequate cause of these modifications, then by the emotion I understand an ACTION (*actio*), if otherwise a PASSION (*passio*).

POSTULATES

I. The human body can be affected in many ways whereby its power of acting is increased or diminished, and again in others which neither increase nor diminish its power of action.

This postulate or axiom is dependent on Post. I and Lemmas 5 and 7, which see, post Prop. 13, Part II.

II. The human body can suffer many changes and yet retain the impressions or traces of objects (Post. 5, Part II.), and consequently the same images of things (Note, Prop. 17, Part II.).

PROPOSITIONS

PROP. I. Our mind acts and also is passive: namely, in so far as it has adequate ideas, thus far it necessarily acts, and in so far as it has inadequate ideas, thus far it necessarily is passive.

Proof. - The ideas of every human mind are some adequate and some mutilated and confused (Note, Prop. 40, Part II.). But the ideas which are adequate in the mind of any one are adequate in God in so far as he constitutes the essence of that mind (Coroll., Prop. 11, Part II.), and those again which are inadequate in the mind of any one are also adequate in God, (same Coroll.), not in so far as he contains in himself solely the essence of the given mind, but in so far as he contains the minds of other things at the same time. Again, from any given idea some effect must necessarily follow (Prop. 36, Part I.), and of this effect God is the adequate cause (Def. I, Part III.), not in so far as he is infinite, but in so far as he is considered as affected by that given idea (Prop. 9, Part II.). But of that effect of which God is the cause, in so far as he is affected by an idea which is adequate in the mind of some one, that same mind is the adequate cause (Coroll., Prop. 11, Part II.). Therefore our mind (Def. 2, Part III.), in so far as it has adequate ideas, necessarily acts: which was the first point. Then whatever follows from an idea which is adequate in God, not in so far as he has in himself the mind of one man only, but in so far as he has in himself the minds of other things at the same time with the mind of this man, of that effect (Coroll., Prop. 11, Part II.) the mind of that man is not the adequate but merely the partial cause. And so (Def. 2, Part III.) the mind, in so far as it has inadequate ideas, necessarily is passive: which was the second point. Therefore our mind, etc. *Q.e.d.*

Corollary.- Hence it follows that the mind is more subject to passions according as it has more inadequate ideas, and, on the other hand, it acts more the more adequate ideas it has.

PROP. II. The body cannot determine the mind to think, nor the mind the body to motion, nor to rest, nor to any other state (if there be any other).

Proof.- All modes of thinking have God for their cause, in so far as he is a thinking thing and not in so far as he is explained by another attribute (Prop. 6, Part II.). Therefore that which determines the mind to think is a mode of thinking and not of extension, that is (Def. I, Part II.), it is not a body: which was the first point. Again, the motion and rest of a body must arise from another body, which also was determined to motion or rest by another body, and absolutely everything which arises in a body must have arisen from God in so far as he is considered as affected by some mode of extension and not some mode of thinking (Prop. 6, Part II.), that is, it cannot arise from a mind, which (Prop. 11, Part II.) is a mode of thinking: which is the second point. Therefore the body cannot, etc. *Q.e.d.*

Note. These points are more clearly understood from what was said in the Note on Prop. 7, Part II., namely, that the mind and body are one and the same thing, which is now conceived under the attribute of thought, now under the attribute of extension. Whence it comes about that the order or concatenation of things is one, or, nature is conceived now under this, now under that attribute, and consequently that the order of the actions and passions of our body is simultaneous in nature with the order of actions and passions of our mind. This also is clear from the manner in which we proved Prop. 12, Part II. But although the situation is such that no reason for doubt can remain, yet I scarcely believe, unless I confirm the matter by experience that men can be induced to consider this calmly: so firmly are they persuaded that the body is moved by the mere command of the mind, or is kept at rest, and that it performs many things which merely depend on the will or ingenuity of the mind. For no one has thus far determined the power of the body, that is, no one has yet been taught by experience what the body can do merely by the laws of nature, in so far as nature is considered merely as corporeal and what it cannot do, save when determined by the mind. For no one has yet had a sufficiently accurate knowledge of the construction of the human body as to be able to explain all its functions: in addition to which there are many things which are observed in brutes which far surpass human sagacity, and many things which sleep-walkers do which they would not dare, were they awake: all of which sufficiently shows that the body can do many things by the laws of its nature alone at which the mind is amazed. Again, no one knows in what manner, or by what means, the mind moves the body, nor how many degrees of motion it can give to the body, nor with what speed it can move it. Whence it follows when men say that this or that action arises from the mind which has power over the body, they know not what they say, or confess with specious words that they are ignorant of the cause of the said action, and have no wonderment at it. But they will say that whether they know or not how the mind moves the body, they have found by experience that unless the mind is apt for thinking the body remains inert: again, that they have learnt from experience that it is in the power of the mind alone to speak or be silent, and many other things which they therefore believe to depend on the decision of the mind. But as for the first point, I ask them whether experience has not also taught them that when the body is inert the mind likewise is inept for thinking? For when the body is asleep and at rest the mind, at the same time, remains asleep, and has not the power of thinking that it has when awake. Again, I think all have discovered by experience that the mind is not at all times equally apt for thinking about one and the same object: but according as the body is more apt, so that the image of this or that object may be excited in it, so the mind is more apt for regarding this or that object. But they will

say that it cannot come about from the laws of nature alone, in so far as nature is regarded only as corporeal, that the causes of buildings, pictures, and things of this kind, which are made by human skill alone, can be deduced, nor can the human body, save if it be determined and led thereto by the mind, build a temple, for example. But I have already shown that they know not what a body can do, or what can be deduced from mere contemplation of its nature, and that they have experience of many things which happen merely by reason of the laws of nature, which they would never have believed could happen save by the direction of the mind, as those things which sleepwalkers do at which they are surprised when they are awake; and I may here draw attention to the construction of the human body, which far surpasses any piece of work made by human art, to say nothing of what I have already shown, namely, that from nature, considered under whatsoever attribute, infinite things follow. As for their second point, surely human affairs would be far happier if the power in men to be silent were the same as that to speak. But experience more than sufficiently teaches that there is nothing less under men's control than their tongues, or less in their power than the control of their appetites. Whence it comes about that many believe that we are free in respect only of those things which we desire only moderately, for then we can restrain our desire for those things by the recollection of something else which we frequently recollect: but with respect to those things which we seek with great emotion, and that nothing can obliterate from the mind, we are by no means free. But in truth, if they did not experience that we do many things for which we are sorry afterwards, and that very often when we are harassed by contrary emotions we 'see the better, yet follow the worse', there would be nothing to prevent them from believing that we do all things freely. Thus an infant thinks that it freely seeks milk, an angry child thinks that it freely desires vengeance, or a timid child thinks it freely chooses flight. Again, a drunken man thinks that he speaks by the free decision of the mind those things which, were he sober, he would keep to himself. Thus a madman, a talkative woman, a child, and people of such kind, think they speak by the free decision of the mind, when, in truth, they cannot put a stop to the impulse to talk. So experience teaches as clearly as reason that men think themselves free on account of this alone, that they are conscious of their actions and ignorant of the causes of them; and moreover that the decisions of the mind are nothing save their appetites, which are various according to various dispositions of the body. For each one manages everything according to his emotion, and thus those who are assailed by conflicting emotions know not what they want: those who are assailed by none are easily driven to one or the other. Now all these things clearly show that the decision of the mind, and the appetite and the determination of the body, are simultaneous in nature, or rather one and the same thing, which when considered under the attribute of thought and explained through the same we call a decision (*decretum*), and when considered under the attribute of extension and deduced from the laws of motion and rest we call a determination (*determinatio*), which will appear more clearly from what will be said on the subject. For there is another point which I wish to be noted specially here, namely, that we can do nothing by a decision of the mind unless we recollect having done so before, e.g., we cannot speak a word unless we recollect having done so. Again, it is not within the free power of the mind to remember or forget anything. Wherefore it is believed that all that is within the power of the mind is the ability to keep to ourselves or speak, according to the decision of the mind alone, the thing we recollect. But when we dream that we speak, we think that we speak from the free decision of the mind, yet we do not speak, or if we do, it is due to a spontaneous motion of the body. We dream again that we conceal something from men, and think that we do so by the same decision of the mind as that by which, when we are awake, we are silent concerning what we know. Finally, we dream that we do certain things by a decision of the mind which were we awake we would dare not: and therefore I should like to know whether there are in the mind two sorts of decisions, fanciful and free? But if our folly is not so great as that, we must necessarily admit that this decision of the mind, which is thought to be free, cannot be distinguished from imagination or memory, nor is it anything else than the affirmation which an idea, in so far as it is an idea, necessarily involves (Prop. 49, Part II.).

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FOURTH PART

On human servitude, or the strength of the emotions

PREFACE

HUMAN lack of power in moderating and checking the emotions I call servitude. For a man who is submissive to his emotions does not have power over himself, but is in the hands of fortune to such an extent that he is often constrained, although he may see what is better for him, to follow what is worse. I purpose accordingly in this part to show the cause of this, and what there is good and bad in the emotions. But before I begin I will preface something concerning perfection and imperfection, and then good and bad.

He that determines to do anything, and finishes it, calls it perfect, and not only does he say this, but so does any one else who rightly knows, or thinks he knows, the mind of the author of that work and his design. For example, if any one sees some work (which I suppose not yet finished), and knows that the design of the author of that work is to build a house, he will call that house imperfect, and on the contrary, he will call it perfect as soon as he sees it brought to the end which its author determined to give to it. But if any one sees some piece of

work the like of which he had never seen, and does not know the mind of the artificer, he clearly will not know whether the work be perfect or not. This seems to have been the first meaning of these words. But afterwards, when men began to form universal ideas and to think out exemplars of houses, buildings, towers, etc., and to prefer certain exemplars to others, it came about that every one called that perfect which he saw to agree with the universal idea which he had formed of that sort of thing, and on the contrary, imperfect what he saw less agree with the exemplar that he had conceived, although in the opinion of the artificer it might be perfect. There seems to be no other reason that men should call natural things which are not made with human hands perfect or imperfect: for men are wont to form universal ideas of natural as well as artificial things, which they regard as exemplars to which nature looks for guidance (for they think that nature does nothing without some end in view). When, therefore, they see something to take place in nature which less agrees with the exemplar that they have conceived of that kind of thing, they think that nature has been guilty of error or has gone astray and has left that thing imperfect. We see thus that men have been wont to call things of nature perfect or imperfect from prejudice rather than from a true knowledge, for we showed in the appendix of the first part that nature does not act with an end in view: for **that eternal and infinite being we call God or nature** acts by the same necessity as that by which it exists, for we showed that it acts from the same necessity of its nature as that by which it exists (see Prop. 16, Part I.).

Therefore the reason or cause why God **or nature** acts and why it exists is one and the same; therefore, as God exists with no end in view, he does not act with any end in view, but has no principle or purpose either in existing or acting. A cause, then, that is called 'final' is nothing save human appetite itself in so far as it is considered as the principle or primary cause of something. E.g., when we say that habitation is the final cause of this or that house, we understand nothing else than this, that man had an appetite for building a house from his imagining the conveniences of domestic life. Wherefore habitation, in so far as it is considered as a final cause, is nothing save this particular appetite, which in truth is the efficient cause which is considered as primary because men are commonly ignorant of the causes of their appetites. For they are, as I have already said, conscious of their actions and appetites, but ignorant of the causes by which they are determined to seek something. The common saying of the vulgar, that nature sometimes is guilty of error and goes astray and produces imperfect things, I count among the fabrications which I dealt with in the appendix of Part I. Therefore perfection and imperfection are in truth only modes of thinking, namely notions, which we are wont to invent owing to the fact that we compare with each other individuals of the same species or genus. And on that account (see above, Def. 6, Part II.) I said that by reality and perfection I understood the same thing. For we are wont to refer all individuals of nature to one class which we call most general, namely, to the notion of being which appertains absolutely to all individuals of nature. In so far as we refer the individuals of nature to this one class, and compare them with each other, and find that some have more reality or being than others, thus far we call some more perfect than others; and in so far as we attribute to them something which involves negation, as limit, end, weakness, etc., thus far we call them imperfect, inasmuch as they do not affect our mind as much as those which we call perfect, and not because there is something wanting in them which is theirs, or that nature has gone astray. For nothing belongs to the nature of anything except that which follows from the necessity of the nature of the efficient cause, and whatever follows from the necessity of the nature of the efficient cause, necessarily happens.

...

4. John Locke (1689)

An Essay Concerning Human Understanding.

Source: *An Essay Concerning Human Understanding* (1689). 38th Edition from William Tegg, London; scanned in three separate excerpts from early in the work.

CHAPTER II

NO INNATE PRINCIPLES IN THE MIND.

1. The way shown how we come by any knowledge, sufficient to prove it not innate. - It is an established opinion among some men, that there are in the understanding certain innate principles; some primarily notions, characters, as it were, stamped upon the mind of man, which the soul receives in its very first being and brings into the world with it. It would be sufficient to convince unprejudiced readers of the falseness of this supposition, if I should only show (as I hope I shall in the following parts of this discourse) how men, barely by the use of their natural faculties, may attain to all the knowledge they have, without the help of any innate impressions, and may arrive at certainty without any such original notions or principles. For I imagine, any one will easily grant, that it would be impertinent to suppose the ideas of colours innate in a creature to whom God hath given sight, and a power to receive them by the eyes from external objects: and no less unreasonable would it be to attribute several truths to the impressions of nature and innate characters, when we may observe in ourselves faculties fit to attain as easy and certain knowledge of them as if they were originally imprinted on the mind.

But because a man is not permitted without censure to follow his own thoughts in the search of truth, when they lead him ever so little out of the common road, I shall set down the reasons that made me doubt of the truth of that opinion as an excuse for my mistake, if I be in one; which I leave to be considered by those who, with me, dispose themselves to embrace truth wherever they find it.

2. General assent the great argument. - There is nothing more commonly taken for granted, than that there are certain principles, both speculative and practical (for they speak of both), universally agreed upon by all mankind; which therefore; they argue, must needs be constant impressions which the souls of men receive in their first beings, and which they bring into the world with them, as necessarily and really as they do any of their inherent faculties.

3. Universal consent proves nothing innate. - This argument, drawn from universal consent, has this misfortune in it, that if it were true in matter of fact that there were certain truths wherein all mankind agreed, it would not prove them innate, if there can be any other way shown, how men may come to that universal agreement in the things they do consent in; which I presume may be done.

4. " What is, is; " and, " It is impossible for the same thing to be, and not to be," not universally assented to. - But, which is worse, this argument of universal consent, which is made use of to prove innate principles, seems to me a demonstration that there are none such; because there are none to which all mankind give an universal assent. I shall begin with the speculative, and instance in those magnified principles of demonstration: " Whatsoever is, is; " and " It is impossible for the same thing to be, and not to be," which, of all others, I think, have the most allowed title to innate. These have so settled a reputation of maxims universally received that it will, no doubt, be thought strange if any one should seem to question it. But yet I take liberty to say, that these propositions are so far from having an universal assent, that there are a great part of mankind to whom they are not so much as known.

5. Not on the mind naturally, imprinted, because not known to children, idiots, etc. - For, first, it is evident, that all children and idiots have not the least apprehension or thought of them; and the want of that is enough to destroy that universal assent, which must needs be the necessary concomitant of all innate truths: it seeming to me near a contradiction to say, that there are truths imprinted on the soul which it perceives or understands not; imprinting, if it signify anything, being nothing else but the making certain truths to be perceived. For to imprint anything on the mind without the mind's perceiving it, seems to me hardly intelligible. If therefore children and idiots have souls, have minds, with those impressions upon them, they must unavoidably perceive them, and necessarily know and assent to these truths; Which, since they do not, it is evident that there are no such impressions. For if they are not notions naturally imprinted, how can they be innate? And if they are notions imprinted, how can they be unknown? To say, a notion is imprinted on the mind, and yet at the same time to say that the mind is ignorant of it, and never yet took notice of it, is to make this impression nothing. No proposition can be said to be in the mind which it never yet knew, which it was never yet conscious of. For if any one say, then, by the same reason, all propositions that are true, and the mind is capable ever of assenting to, may be said to be in the mind, and to be imprinted; since if any one can be said to be in the mind, which it never yet knew, it must be only because it is capable of knowing it; and so the mind is of all truths it ever shall know. Nay, thus

truths may be imprinted on the mind which it never did, nor ever shall, know: for a man may live long and die at last in ignorance of many truths which his mind was capable of knowing, and that with certainty. So that if the capacity of knowing be the natural impression contended for, all the truths a man ever comes to know will, by this account, be every one of them innate: and this great point will amount to no more, but only to a very improper way of speaking; which, whilst it pretends to assert the contrary, says nothing different from those who deny innate principles. For nobody, I think, ever denied that the mind was capable of knowing several truths. The capacity, they say, is innate; the knowledge acquired. But then, to what end such contest for certain innate maxims? If truths can be imprinted on the understanding without being perceived I can see no difference there can be between any truths the mind is capable of knowing in respect of their original: they must all be innate, or all adventitious; in vain shall a man go about to distinguish them. He therefore that talks of innate notions in the understanding, cannot (if he intend thereby any distinct sort of truths) mean such truths to be in the understanding as it never perceived, and is yet wholly ignorant of. For if these words ("to be in the understanding") have any propriety, they signify to be understood. So that, to be in the understanding and not to be understood; to be in the mind, and never to be perceived; is all one as to say, anything is, and is not, in the mind or understanding. If therefore these two propositions: "Whatsoever is, is;" and, "It is impossible for the same thing to be, and not to be," are by nature imprinted, children cannot be ignorant of them; infants, and all that have souls, must necessarily have them in their understandings, know the truth of them, and assent to it.

6. That men know them when they come to the use of reason, answered. - To avoid this, it is usually answered, that all well know and assent to them, when they come to the use of reason; and this is enough to prove them innate. I answer,

7. Doubtful expressions, that have scarce any signification, go for clear results to those who, being prepossessed, take not the pains to examine even what they themselves say. For, to apply this answer with any tolerable sense to our present purpose, it must signify one of these two things; either, that, as soon as men come to the use of reason, these supposed native inscriptions come to be known and observed by them; or else, that the use and exercise of men's reasons assists them in the discovery of these principles, and certainly makes them known to them.

8. If reason discovered them, that would not prove them innate. - If they mean that by the use of reason men may discover these principles, and that this is sufficient to prove them innate, their way of arguing will stand thus: viz. That, whatever truths reason can certainly discover to us and make us firmly assent to, those are all naturally imprinted on the mind; since that universal assent which is made the mark of them, amounts to no more but this - that by the use of reason we are capable to come to a certain knowledge of, and assent to, them; and by this means there will be no difference between the maxims of the mathematicians and theorems they deduce from them: all must be equally allowed innate, they being all discoveries made by the use of reason and truths that a rational creature may certainly come to know, if he apply his thoughts rightly that way.

9. It is false that reason discovers them. - But how can these men think the use of reason necessary to discover principles that are supposed innate, when reason (if we may believe them) is nothing else but the faculty of deducing unknown truths from principles or propositions that are already known? That certainly can never be thought innate which we have need of reason to discover, unless, as I have said, we will have all the certain truths that reason ever teaches us to be innate. We may as well think the use of reason necessary to make our eyes discover visible objects as that there should be need of reason, or the exercise thereof to make the understanding see what is originally engraved in it, and cannot be in the understanding before it be perceived by it. So that to make reason discover these truths thus imprinted, is to say, that the use of reason discovers to a man what he knew before; and if men have those innate impressed truths originally, and before the use of reason and yet are always ignorant of them till they come to the use of reason, it is in effect to say that men know, and know them not, at the same time.

10. It will here perhaps be said, that mathematical demonstrations, and other truths that are not innate, are not assented to, as soon as proposed, wherein they are distinguished from these maxims and other innate truths. I shall have occasion to speak of assent upon the first proposing, more particularly by and by. I shall here only, and that very readily, allow, that these maxims and mathematical demonstrations are in this different - that the one has need of reason using of proofs to make them out and to gain our assent; but the other, as soon as understood, are, without any the least reasoning, embraced and assented to. But I withal beg leave to observe, that it lays open the weakness of this subterfuge which requires the use of reason for the discovery of these general truths, since it must be confessed, that in their discovery there is no use made of reasoning at all. And I think those who give this answer will not be forward to affirm, that the knowledge of this maxim, "That it is impossible for the same thing to be, and not to be," is a deduction of our reason. For this would be to destroy that bounty of nature they seem so fond of, whilst they make the knowledge of those principles to depend on the labour of our thoughts; for all reasoning is search and casting about, and requires pains and application. ...

BOOK II, CHAPTER I: OF IDEAS IN GENERAL, AND THEIR ORIGINAL.

1. Idea is the object of thinking. - Every man being conscious to himself, that he thinks, and that which his mind is applied about, whilst thinking, being the ideas that are there, it is past doubt that men have in their mind several ideas, such as are those expressed by the words, "whiteness, hardness, sweetness, thinking, motion, man, elephant, army, drunkenness," and others. It is in the first place then to be inquired, How he comes by them? I know it is a received doctrine, that men have native ideas and original characters stamped upon their minds in their very first being. This opinion I have at large examined already; and, I suppose, what I have said in the foregoing book will be much more easily admitted, when I have shown whence the understanding may get all the ideas it has, and by what ways and degrees they may come into the mind; for which I shall appeal to every one's own observation and experience.

2. All ideas come from sensation or reflection. - Let us then suppose the mind to be, as we say, **white paper** [*tabula rasa*], void of all characters without any ideas; how comes it to be furnished? Whence comes it by that vast store, which the busy and boundless fancy of man has painted on it with an almost endless variety? Whence has it all the materials of reason and knowledge? To this I answer, in one word, From experience: in that all our knowledge is founded, and from that it ultimately derives itself. Our observation, employed either about external sensible objects, or about the internal operations of our minds, perceived and reflected on by ourselves is that which supplies our understandings with all the materials of thinking. These two are the fountains of knowledge, from whence all the ideas we have, or can naturally have, do spring.

3. The object of sensation one source of ideas. - First. Our senses, conversant about particular sensible objects, do convey into the mind several distinct perceptions of things, according to those various ways wherein those objects do affect them; and thus we come by those ideas we have of yellow, white, heat, cold, soft, hard, bitter, sweet, and all those which we call sensible qualities; which when I say the senses convey into the mind, I mean, they from external objects convey into the mind what produces there those perceptions. This great source of most of the ideas we have., depending wholly upon our senses, and derived by them to the understanding, I call, "sensation."

4. The operations of our minds the other source of them. - Secondly. The other fountain, from which experience furnisheth the understanding with ideas, is the perception of the operations of our own minds within us, as it is employed about the ideas it has got; which operations, when the soul comes to reflect on and consider, do furnish the understanding with another set of ideas which could not be had from things without and such are perception, thinking, doubting, believing, reasoning, knowing, willing, and all the different actings of our own minds; which we, being conscious of, and observing in ourselves, do from these receive into our understandings as distinct ideas, as we do from bodies affecting our senses. This source of ideas every man has wholly in himself; and though it be not sense as having nothing to do with external objects, yet it is very like it, and might properly enough be called "internal sense." But as I call the other "sensation," so I call this "reflection," the ideas it affords being such only as the mind gets by reflecting on its own operations within itself. By reflection, then, in the following part of this discourse, I would be understood to mean that notice which the mind takes of its own operations, and the manner of them, by reason whereof there come to be ideas of these operations in the understanding. These two, I say, viz., external material things as the objects of sensation, and the operations of our own minds within as the objects of reflection, are to me, the only originals from whence all our ideas take their beginnings. The term "operations" here, I use in a large sense, as comprehending not barely the actions of the mind about its ideas, but some sort of passions arising sometimes from them, such as is the satisfaction or uneasiness arising from any thought.

5. All our ideas are of the one or the other of these. - The understanding seems to me not to have the least glimmering of any ideas which it doth not receive from one of these two. External objects furnish the mind with the ideas of sensible qualities, which are all those different perceptions they produce in us; and the mind furnishes the understanding with ideas of its own operations.

These, when we have taken a full survey of them, and their several modes, combinations, and relations, we shall find to contain all our whole stock of ideas, and that we have nothing in our mind which did not come in one of these two ways. Let anyone examine his own thoughts; and thoroughly search into his understanding, and then let him tell me, whether all the original ideas he has there, are any other than of the objects of his senses, or of the operations of his mind considered as objects of his reflection; and how great a mass of knowledge soever he imagines to be lodged there, he will, upon taking a strict view see that he has not any idea in his mind but what one of these two have imprinted, though perhaps with infinite variety compounded and enlarged by the understanding, as we shall see hereafter.

6. Observable in children. - He that attentively considers the state of a child at his first coming into the world, will have little reason to think him stored with plenty of ideas that are to de the matter of his future knowledge. It is by degrees he comes to be furnished with them; and though the ideas of obvious and familiar qualities imprint

themselves before the memory begins to keep a register of time and order, yet it is often so late before some unusual qualities come in the way, that there are few men that cannot recollect the beginning of their acquaintance with them: and, if it were worth while, no doubt a child might be so ordered as to have but a very few even of the ordinary ideas till he were grown up to a man. But all that are born into the world being surrounded with bodies that perpetually and diversely affect them, variety of ideas whether care be taken about it, or no, are imprinted on the minds of children. Light and colours are busy at hand every where when the eye is but open; sounds and some tangible qualities fail not to solicit their proper senses and force an entrance to the mind; but yet I think it will be granted easily, that if a child were kept in a place where he never saw any other but black and white till he were a man, he would have no more ideas of scarlet or green, than he that from his childhood never tasted an oyster or a pine-apple has of those particular relishes.

7. Men are differently furnished with these according to the different objects they converse with. - Men then come to be furnished with fewer or more simple ideas from without, according as the objects they converse with afford greater or less variety; and from the operations of their minds within, according as they more or less reflect on them. For, though he that contemplates the operations of his mind cannot but have plain and clear ideas of them; yet, unless he turn his thoughts that way, and considers them attentively, he will no more have clear and distinct ideas of all the operations of his mind, and all that may be observed therein than he will have all the particular ideas of any landscape or of the parts and motions of a clock, who will not turn his eyes to it, and with attention heed all the parts of it. The picture or clock may be so placed, that they may come in his way every day; but yet he will have but a confused idea of all the parts they are made of, till he applies himself with attention to consider them each in particular. ...

CHAPTER III: OF IDEAS OF ONE SENSE

I. Division of simple ideas. - The better to conceive the ideas we receive from sensation, it may not be amiss for us to consider them in reference to the different ways whereby they make their approaches to our minds, and make themselves perceivable by us.

First, then, there are some which come into our minds by one sense only.

Secondly. There are others that convey themselves into the mind by more senses than one.

Thirdly. Others first are had from reflection only.

Fourthly. There are some that make themselves way, and are suggested to the mind, by all the ways of sensation and reflection.

We shall consider them apart under these several heads.

1. There are some ideas which have admittance only through one sense, which is peculiarly adapted to receive them. Thus light and colours, as white, red, yellow, blue, with their several degrees or shades and mixtures, as green, scarlet, purple, sea-green, and the rest, come in only by the eyes; all kinds of noises, sounds, and tones, only by the ears; the several tastes and smells, by the nose and palate. And if these organs, or the nerves which are the conduits to convey them from without to their audience in the brain, the mind's presence-room, (as I may so call it,) are, any of them, so disordered as not to perform their functions, they have no postern to be admitted by, no other way to bring themselves into view, and be received by the understanding.

The most considerable of those belonging to the touch are heat and cold, and solidity; all the rest - consisting almost wholly in the sensible configuration, as smooth and rough; or else more or less firm adhesion of the parts, as hard and soft, tough and brittle - are obvious enough.

2. I think it will be needless to enumerate all the particular simple ideas belonging to each sense. Nor indeed is it possible it we would, there being a great many more of them belonging to most of the senses than we have names for. The variety of smells, which are as many almost, if not more, than species of bodies in the world, do most of them want name. *Sweet* and *stinking* commonly serve our turn for these ideas, which in effect is little more than to call them pleasing or displeasing; though the smell of a rose and violet, both sweet, are certainly very distinct ideas. Nor are the different tastes that by, our palates we receive ideas of, much better provided with names. *Sweet, bitter, sour, harsh, and salt*, are almost all the epithets we have to denominate that numberless variety of relishes which are to be found distinct, not only in almost every sort of creatures but in the different parts of the same plant, fruit, or animal. The same may be said of colours and sounds. I shall therefore, in the account of simple ideas I am here giving, content myself to set down only such as are most material to our present purpose, or are in themselves less apt to be taken notice of, though they are very frequently the ingredients of our complex ideas; amongst which I think I may well account "solidity" which therefore I shall treat of in the next chapter.

5. Bishop George Berkeley (1710)

Of the Principles of Human Knowledge.

Source: *Of the Principles of Human Knowledge* (1710). From very old edition. First 20 or so pages.

PART I

1. IT is evident to any one who takes a survey of the objects of human knowledge, that they are either ideas actually imprinted on the senses; or else such as are perceived by attending to the passions and operations of the mind; or lastly, ideas formed by help of memory and imagination - either compounding, dividing, or barely representing those originally perceived in the aforesaid ways. - By sight I have the ideas of light and colours, with their several degrees and variations By touch I perceive hard and soft, heat and cold, motion and resistance, and of all these more and less either as to quantity or degree. Smelling furnishes me with odours; the palate with tastes; and hearing conveys sounds to the mind in all their variety of tone and composition. - And as several of these are observed to accompany each other, they come to be marked by one name, and so to be reputed as one THING. Thus, for example, a certain colour, taste, smell, figure and consistence having been observed to go together, are accounted one distinct thing, signified by the name *apple*; other collections of ideas constitute a stone, a tree, a book, and the like sensible things - which as they are pleasing or disagreeable excite the passions of love, hatred, joy, grief, and so forth.

2. But, besides all that endless variety of ideas or objects of knowledge, there is likewise something which knows or perceives them; and exercises divers operations, as willing, imagining, remembering, about them. This perceiving, active being is what I call MIND, SPIRIT, SOUL, or MYSELF. By which words I do not denote any one of my ideas, but a thing entirely distinct from them, wherein they exist, or, which is the same thing, whereby they are perceived - for the existence of an idea consists in being perceived.

3. That neither our thoughts, nor passions, nor ideas formed by the imagination, exist without the mind, is what everybody will allow --And to me it is no less evident that the various SENSATIONS, or *ideas imprinted on the sense*, however blended or combined together (that is, whatever objects they compose), cannot exist otherwise than in a mind perceiving them - I think an intuitive knowledge may be obtained of this by any one that shall attend to *what is meant by the term exist when applied to sensible things*. The table I write on I say exists, that is, I see and feel it; and if I were out of my study I should say it existed - meaning thereby that if I was in my study I might perceive it, or that some other spirit actually does perceive it. There was an odour, that is, it was smelt; there was a sound, that is, it was heard; a colour or figure, and it was perceived by sight or touch. This is all that I can understand by these and the like expressions. - For as to what is said of the absolute existence of unthinking things without any relation to their being perceived, that is to me perfectly unintelligible Their *esse* is *percipi*, nor is it possible they should have any existence out of the minds or thinking things which perceive them.

4. It is indeed an opinion strangely prevailing amongst men, that houses, mountains, rivers, and in a word all sensible objects, have an existence, natural or real, distinct from their being perceived by the understanding. But, with how great an assurance and acquiescence soever this principle may be entertained in the world, yet whoever shall find in his heart to call it in question may, if I mistake not, perceive it to involve a manifest contradiction. For, what are the forementioned objects but the things we perceive by sense? and what do we perceive besides our own ideas or sensations? and is it not plainly repugnant that any one of these, or any combination of them, should exist unperceived?

5. If we thoroughly examine this tenet it will, perhaps, be found at bottom to depend on the doctrine of *abstract ideas*. For can there be a nicer strain of abstraction than to distinguish the existence of sensible objects from their being perceived, so as to conceive them existing unperceived? Light and colours, heat and cold, extension and figures - in a word the things we see and feel - what are they but so many sensations, notions, ideas, or impressions on the sense? and is it possible to separate, even in thought, any of these from perception? For my part, I might as easily divide a thing from itself. I may, indeed, divide in my thoughts, or conceive apart from each other, those things which, perhaps, I never perceived by sense so divided Thus, I imagine the trunk of a human body without the limbs, or conceive the smell of a rose without thinking on the rose itself. So far, I will not deny, I can abstract - if that may properly be called *abstraction* which extends only to the conceiving separately such objects as it is possible may really exist or be actually perceived asunder. But my conceiving or imagining power does not extend beyond the possibility of real existence or perception. Hence, as it is impossible for me to see or feel anything without an actual sensation of that thing, so is it impossible for me to conceive in my thoughts any sensible thing or object distinct from the sensation or perception of it.

6. Some truths there are so near and obvious to the mind that a man need only open his eyes to see them Such I take this important one to be, viz. that all the choir of heaven and furniture of the earth, in a word all those bodies

which compose the mighty frame of the world, have not any subsistence without a mind - that their *being is to be perceived or known*; that consequently so long as they are not actually perceived by me, or do not exist in my mind or that of any other created spirit, they must either have no existence at all, or else subsist in the mind of some Eternal Spirit - -it being perfectly unintelligible, and involving all the absurdity of abstraction, to attribute to any single part of them any existence independent of a spirit. To be convinced of which, the reader need only reflect, and try to separate in his own thoughts the *being* of a sensible thing from its *being perceived*.

7. From what has been said it is evident there is not any other Substance than SPIRIT, or that which perceives. But, for the fuller demonstration of this point, let it be considered the sensible qualities are colour, figure, motion, smell, taste, etc, i.e. the ideas perceived by sense. Now, for an idea to exist in an unperceiving thing is a manifest contradiction; for to have an idea is all one as to perceive; that therefore wherein colour, figure, etc exist must perceive them; hence it is clear there can be no unthinking substance or *substratum* of those ideas.

8. But, say you, though the ideas themselves do not exist without the mind, yet there may be things like them, whereof they are copies or resemblances, which things exist without the mind in an unthinking substance. I answer, an idea can be like nothing but an idea; a colour or figure can be like nothing but another colour or figure. If we look but never so little into our own thoughts, we shall find it impossible for us to conceive a likeness except only between our ideas. Again, I ask whether those supposed originals or external things, of which our ideas are the pictures or representations, be themselves perceivable or no? If they are, then they are ideas and we have gained our point; but if you say they are not, I appeal to any one whether it be sense to assert a colour is like something which is invisible; hard or soft, like something which is intangible; and so of the rest.

9. Some there are who make a distinction betwixt, *primary* and *secondary* qualities'. By the former they mean extension, figure, motion, rest, solidity, impenetrability, and number; by the latter they denote all other sensible qualities, as colours, sounds, tastes, and so forth. The ideas we have of these last they acknowledge not to be the resemblances of anything existing without the mind, or unperceived, but they will have our ideas of the primary qualities to be patterns or images of things which exist without the mind, in an unthinking substance which they call matter. - By Matter, therefore, we are to understand *an inert, senseless substance, in which extension, figure and motion do actually subsist*. But it is evident, from what we have already shewn, that extension, figure, and motion are only ideas existing in the Mind, and that an idea can be like nothing but another idea, and that consequently neither they nor their archetypes can exist in an unperceiving substance. Hence, it is plain that the very notion of what is called Matter or *corporeal substance* involves a contradiction in it.

10. They who assert that figure, motion, and the rest of the primary or original qualities do exist without the mind, in unthinking substances, do at the same time acknowledge that colours, sounds, heat, cold, and suchlike secondary qualities, do not - which they tell us are sensations existing in the mind alone, that depend on and are occasioned by the different size, texture, and motion of the minute particles of matter. This they take for an undoubted truth, which they can demonstrate beyond all exception. Now, if it be certain that those original qualities are inseparably united with the other sensible qualities, and not, even in thought, capable of being abstracted from them, it plainly follows that they exist only in the mind. But I desire any one to reflect and try whether he can, by any abstraction of thought, conceive the extension and motion of a body without all other sensible qualities. For my own part, I see evidently that it is not in my power to frame an idea of a body extended and moving, but I must withal give it some colour or other sensible quality which is acknowledged to exist only in the mind. In short, extension, figure, and motion, abstracted from all other qualities, are inconceivable. Where therefore the other sensible qualities are, there must these be also, to wit, in the mind and nowhere else.

11. Again, *great* and *small*, *swift* and *slow*, are allowed to exist nowhere without the mind, being entirely relative, and changing as the frame or position of the organs of sense varies. The extension therefore which exists without the mind is neither great nor small, the motion neither swift nor slow, that is, they are nothing at all. But, say you, they are extension in general, and motion in general thus we see how much the tenet of extended moveable substances existing without the mind depends on that strange doctrine of abstract ideas. And here I cannot but remark how nearly the vague and indeterminate description of Matter or corporeal substance, which the modern philosophers are run into by their on by principles, resembles that antiquated and so much ridiculed notion of *materia prima*, to be met with in Aristotle and his followers. Without extension solidity cannot be conceived; since therefore it has been shewn that extension exists not in an unthinking substance, the same must also be true of solidity.

12. That number is entirely the creature of the mind, even though the other qualities be allowed to exist without, it will be evident to whoever considers that the same thing bears a different denomination of number as the mind views it with different respects. Thus, the same extension is one, or three, or thirty-six, according as the mind considers it with reference to a yard, a foot, or an inch. Number is so visibly relative, and dependent on men's understanding, that it is strange to think how any one should give it an absolute existence without the mind. We say one book, one page, one line, etc.; all these are equally units, though some contain several of the others. And

in each instance, it is plain, the unit relates to some particular combination of ideas arbitrarily put together by the mind.

13. Unity I know some will have to be a simple or uncompounded idea, accompanying all other ideas into the mind That I have any such idea answering the word *unity* I do not find; and if I had, methinks I could not miss finding it on the contrary, it should be the most familiar to my understanding, since it is said to accompany all other ideas, and to be perceived by all the ways of sensation and reflection To say no more, it is an *abstract* idea.

14. I shall further add, that, after the same manner as modern philosophers prove certain sensible qualities to have no existence in Matter, or without the mind, the same thing may be likewise proved of all other sensible qualities whatsoever. Thus, for instance, it is said that heat and cold are affections only of the mind, and not at all patterns of real beings existing in the corporeal substances which excite them, for that the same body which appears cold to one hand seems warm to another. Now, why may we not as well argue that figure and extension are not patterns or resemblances of qualities existing in Matter, because to the same eye at different stations, or eyes of a different texture at the same station, they appear various, and cannot therefore be the images of anything settled and determinate without the mind? Again, it is proved that sweetness is not really in the sapid thing, because the thing remaining unaltered the sweetness is changed into bitter, as in case of a fever or otherwise vitiated palate. Is it not as reasonable to say that motion is not without the mind, since if the succession of ideas in the mind become swifter the motion, it is acknowledged, shall appear slower without any alteration in any external object.

15. In short, let any one consider those arguments which are thought manifestly to prove that colours and tastes exist only in the mind, and he shall find they may with equal force be brought to prove the same thing of extension, figure, and motion - Though it must be confessed this method of arguing does not so much prove that there is no extension or colour in an outward object, as that *we* do not know by *sense* which is the *true* extension or colour of the object But the arguments foregoing plainly shew it to be impossible that any colour or extension at all, or other sensible quality whatsoever, should exist in an unthinking subject without the mind, or in truth, that there should be any such thing as an outward object.

16. But let us examine a little the received opinion - It is said extension is a mode or accident [or **Attribute**] of Matter, and that Matter is the *substratum* that supports it. Now I desire that you would explain to me what is meant by Matter's *supporting* extension. Say you, I have no idea of Matter and therefore cannot explain it. I answer, though you have no positive, yet, if you have any meaning at all, you must at least have a relative idea of Matter; though you know not what it is, yet you must be supposed to know what relation it bears to accidents, and what is meant by its supporting them It is evident 'support' cannot here be taken in its usual or literal sense - as when we say that pillars support a building; in what sense therefore must it be taken?

17. If we inquire into what the most accurate philosophers declare themselves to mean by *material substance*, we shall find them acknowledge they have no other meaning annexed to those sounds but the idea of *being in general*. together with the relative notion of its *supporting accidents*. The general idea of Being appeareth to me the most abstract and incomprehensible of all other; and as for its supporting accidents, thus, as we have just now observed, cannot be understood in the common sense of those words; it must therefore be taken in some other sense, but what that is they do not explain. So that when I consider the two parts or branches which make the signification of the words *material substance*, I am convinced there is no distinct meaning annexed to them. But why should we trouble ourselves any farther, in discussing this material *substratum* or 'support' of figure, and motion, and other sensible qualities? Does it not suppose *they* have an existence without the mind? And is not this a direct repugnancy, and altogether inconceivable?

18. But, though it were possible that solid, figured, moveable substances may exist without the mind, corresponding to the ideas we have of bodies, yet how is it possible for us to know this? Either we must know it by Sense or by Reason - As for our senses, By them we have the knowledge only of our sensations, ideas, or those things that are immediately perceived by sense, call them what you will: but they do not inform us that things exist without the mind, or unperceived, like to those which are perceived. This the Materialists themselves acknowledge. - It remains therefore that if we have any knowledge at all of external things, it must be by Reason inferring their existence from what is immediately perceived by sense But what reason can induce us to believe the existence of bodies without the mind, from what we perceive, since the very patrons of Matter themselves do not pretend there is any necessary connection betwixt them and our ideas? I say it is granted on all hands-and what appears in dreams, frenzies, and the like, puts it beyond dispute - that it is possible we might be affected with all the ideas we have now, though there were no bodies existing without resembling them. Hence, it is evident the supposition of external bodies is not necessary for the producing our ideas; since it is granted they are produced sometimes, and might possibly be produced always in the same order we see them in at present, without their concurrence.

19. But, though we might possibly have all our sensations without them, yet perhaps it may be thought easier to conceive and explain the manner of their production, by supposing external bodies in their likeness rather than otherwise; and so it might be at least probable there are such things as bodies that excite their ideas in our minds. But neither can this be said; for, though we give the materialists their external bodies, they by their own confession are never the nearer knowing *how* our ideas are produced; since they own themselves unable to comprehend in what manner body can act upon spirit, or how it is possible it should imprint any idea in the mind. Hence it is evident the production of ideas or sensations in our minds can be no reason why we should suppose Matter or corporeal substances, since *that* is acknowledged to remain equally inexplicable with or without this supposition. If therefore it were possible for bodies to exist without the mind, yet to hold they do so must needs be a very precarious opinion; since it is to suppose, without any reason at all, that God has created innumerable beings that are entirely useless, and serve to no manner of purpose.

20. In short, if there were external bodies, it is impossible we should ever come to know it; and if there were not, we might have the very same reasons to think there were that we have now. Suppose - what no one can deny possible - an intelligence *without the help of external bodies*, to be affected with the same train of sensations or ideas that you are, imprinted in the same order and with like vividness in his mind. I ask whether that intelligence hath not all the reason to believe the existence of corporeal substances, represented by his ideas, and exciting them in his mind, that you can possibly have for believing the same thing? Of this there can be no question - which one consideration were enough to make any reasonable person suspect the strength of whatever arguments he may think himself to have, for the existence of bodies without the mind.

21. Were it necessary to add any farther proof against the Existence of Matter, after what has been said, I could instance several of those errors and difficulties (not to mention impieties) which have sprung from that tenet. It has occasioned numberless controversies and disputes in philosophy, and not a few of far greater moment in religion. But I shall not enter into the detail of them in this place, as well because I think arguments *a posteriori* are unnecessary for confirming what has been, if I mistake not sufficiently demonstrated *a priori*, as because I shall hereafter find occasion to speak somewhat of them.

22. I am afraid I have given cause to think I am needlessly prolix in handling this subject For, to what purpose is it to dilate on that which may be demonstrated with the utmost evidence in a line or two, to any one that is capable of the least reflection? It is but looking into your own thoughts, and so trying whether you can conceive it possible for a sound, or figure, or motion, or colour to exist without the mind or unperceived. This easy trial may perhaps make you see that what you contend for is a downright contradiction. Insomuch that I am content to put the whole upon this issue - if you can but conceive it possible for one extended moveable substance, or, in general, for any one idea, or anything like an idea, to exist otherwise than in a mind perceiving it, I shall readily give up the cause. And, as for all that compages of external bodies you contend for, I shall grant you its existence, though you cannot either give me any reason why you believe it exists, or assign any use to it when it is supposed to exist I say, the bare possibility of your opinions being true shall pass for an argument that it is so.

23. But, say you, surely there is nothing easier than for me to imagine trees, for instance, in a park, or books existing in a closet, and nobody by to perceive them. I answer, you may so, there is no difficulty in it; but what is all this, I beseech you, more than framing in *your* mind certain ideas which you call books and trees, and at the same time omitting to frame the idea of any one that may perceive them? But do not you yourself perceive or think of them all the while? This therefore is nothing to the purpose it only shews you have the power of imagining or forming ideas in your mind; but it does not shew that you can conceive it possible the objects of your thought may exist without the mind. To make out this, it is necessary that *you* conceive them existing unconceived or unthought of, which is a manifest repugnancy. When we do our utmost to conceive the existence of external bodies, we are all the while only contemplating our own ideas. But the mind, *taking no notice of itself*, is deluded to think it can and does conceive bodies existing unthought of or without the mind, though at the same time they are apprehended by or exist in itself. A little attention will discover to any one the truth and evidence of what is here said, and make it unnecessary to insist on any other proofs against the existence of *material substance*.

24. It is very obvious, upon the least inquiry into our own thoughts, to know whether it be possible for us to *understand* what is meant by the *absolute* existence of sensible objects *in themselves*, or *without the mind*. To me it is evident those words mark out either a direct contradiction, or else nothing at all. And to convince others of this, I know no readier or fairer way than to entreat they would calmly attend to their own thoughts; and if by this attention the emptiness or repugnancy of those expressions does appear, surely nothing more is requisite for their conviction. It is on this therefore that I insist, to wit, that the absolute existence of unthinking things are words without a meaning, or which include a contradiction. This is what I repeat and inculcate, and earnestly recommend to the attentive thoughts of the reader.

25. All our ideas, sensations, notions, or the things which we perceive, by whatsoever names they may be distinguished, are visibly inactive - there is nothing of Power or Agency included in them So that one idea or object of thought cannot produce or make any alteration in another.

- To be satisfied of the truth of this, there is nothing else requisite but a bare observation of our ideas. For, since they and every part of them exist only in the mind, it follows that there is nothing in them but what is perceived; but whoever shall attend to his ideas, whether of sense or reflection, will not perceive in them any power or activity; there is, therefore, no such thing contained in them A little attention will discover to us that the very being of an idea implies passiveness and inertness in it, insomuch that it is impossible for an idea to do anything, or, strictly speaking, to be the cause of anything neither can it be the resemblance or pattern of any active being, as is evident from sect 8. Whence it plainly follows that extension, figure, and motion cannot be the cause of our sensations. To say, therefore, that these are the effects of powers resulting from the configuration, number, motion, and size of corpuscles, must certainly be false.

26. We perceive a continual succession of ideas, some are anew excited, others are changed or totally disappear There is therefore some Cause of these ideas, whereon they depend, and which produces and changes them. That this cause cannot be any quality, or idea, or combination of ideas is clear from the preceding section. It must therefore be a substance; but it has been shewn that there is no corporeal or material substance: it remains therefore that the cause of ideas is an incorporeal active substance or Spirit.

27. A Spirit is one simple, undivided, active being - as it *perceives* ideas it is called the *Understanding*, and as it *produces* or otherwise *operates* about them it is called the *Will*. Hence there can be no idea formed of a soul or spirit; for, all ideas whatever, being passive and inert, (vid sect 25,) cannot represent unto us, by way of image or likeness, that which acts. A little attention will make it plain to any one that to have an idea which shall be *like* that active principle of motion and change of ideas is absolutely impossible. Such is the nature of Spirit, or that which acts; that it cannot be of itself perceived, but only by the effects which it produceth. - If any man shall doubt of the truth of what is here delivered, let him but reflect and try if we can frame the idea of any Power or Active Being; and whether he has ideas of two principal powers, marked by the names *Will* and *Understanding*, distinct from each other, as well as from a third idea of Substance or Being in general, with a relative notion of its supporting or being the subject of the aforesaid powers which is signified by the name Soul or Spirit. This is what some hold; but, so far as I can see, the words *will*, *soul*, *spirit*, do not stand for different ideas, or, in truth, for any idea at all, but for something which is very different from ideas, and which, being an Agent, cannot be like unto, or represented by, any idea whatsoever. [Though it must be owned at the same time that we have some notion of soul, spirit, and the operations of the mind; such as willing, loving, hating - inasmuch as we know or understand the meaning of these words].

28. I find I can excite ideas in my mind at pleasure, and vary and shift the scene as oft as I think fit. It is no more than willing, and straightway this or that idea arises in my fancy; and by the same power it is obliterated and makes way for another. This making and unmaking of ideas doth very properly denominate the mind active. Thus much is certain and grounded on experience: but when we talk of unthinking agents, or of exciting ideas exclusive of Volition, we only amuse ourselves with words.

29. But, whatever power I may have over my own thoughts, I find the ideas actually perceived by Sense have not a like dependence on my will, when in broad daylight I open my eyes, it is not in my power to choose whether I shall see or no, or to determine what particular objects shall present themselves to my view; and so likewise as to the hearing and other senses, the ideas imprinted on them are not creatures of my will. There is therefore some other Will or Spirit that produces them.

30. The ideas of Sense are more strong, lively, and distinct than those of the Imagination; they have likewise a steadiness, order, and coherence, and are not excited at random, as those Which are the effects of human wills often are, but in a regular train or series - the admirable connection whereof sufficiently testifies the wisdom and benevolence of its Author Now the set rules or established methods wherein the Mind we depend on excites in us the ideas of sense, are called the *laws of nature*; and these we learn by experience, which teaches us that such and such ideas are attended with such and such other ideas, in the ordinary course of things.

31. This gives us a sort of foresight which enables us to regulate our actions for the benefit of life. And without this we should be eternally at a loss; we could not know how to act anything that might procure us the least pleasure, or remove the least pain of sense. That food nourishes sleep refreshes, and fire warms us; that to sow in the seedtime is the way to reap in the harvest; and in general that to obtain such or such ends, such or such means are conducive - all this we know, not by discovering any *necessary connection* between our ideas, but only by the observation of the settled laws of nature, without which we should be all in uncertainty and confusion, and a grown man no more know how to manage himself in the affairs of life than an infant just born.

32. And yet this consistent uniform working, which so evidently displays the goodness and wisdom of that Governing Spirit whose will constitutes the laws of nature, is so far from leading our thoughts to him, that it

rather sends them wandering after second causes For, when we perceive certain ideas of Sense constantly followed by other ideas and we know this is not of our own doing, we forthwith attribute power and agency to the ideas themselves, and make one the cause of another, than which nothing can be more absurd and unintelligible Thus, for example, having observed that when we perceive by sight a certain round luminous figure we at the same time perceive by touch the idea or sensation called heat, we do from thence conclude the sun to be the cause of heat. And in like manner perceiving the motion and collision of bodies to be attended with sound, we are inclined to think the latter the *effect* of the former.

33. The ideas imprinted on the Senses by the Author of nature are called *real things*. and those excited in the Imagination being less regular, vivid, and constant, are more properly termed *ideas*, or images of things, which they copy and represent. But then our sensations, be they never so vivid and distinct, are nevertheless ideas, that is, they exist in the mind, or are perceived by it, as truly as the ideas of its own framing. The ideas of Sense are allowed to have more reality in them, that is, to be more strong, ordered, and coherent than the creatures of the mind; but this is no argument that they exist without the mind. They are also less dependent on the spirit, or thinking substance which perceives them, in that they are excited by the will of another and more powerful Spirit; yet still they are *ideas*, and certainly no idea, whether faint or strong, can exist otherwise than in a mind perceiving it.

34. Before we proceed any farther it is necessary we spend some time in answering objections which may probably be made against the principles we have hitherto laid down. In doing of which, if I seem too prolix to those of quick apprehensions, I desire I may be excused, since all men do not equally apprehend things of this nature, and I am willing to be understood by every one.

First, then, it will be objected that by the foregoing principles all that is real and substantial in nature is banished out of the world, and instead thereof a chimerical scheme of ideas takes place. All things that exist only in the mind, that is, they are merely notional. What therefore becomes of the sun, moon, and stars? What must we think of houses, rivers, mountains, trees, stones; nay, even of our own bodies? Are all these but so many chimeras and illusions on the fancy? - To all which, and whatever else of the same sort may be objected, I answer, that by the principles premised we are not deprived of any one thing in nature. Whatever we see, feel, hear, or any wise conceive or understand, remains as secure as ever, and is as real as ever. There is a *rerum natura* and the distinction between realities and chimeras retains its full force. This is evident from sect 20, 30, and 33, where we have shewn what is meant by *real things*, in opposition to *chimeras* or ideas of our own framing; But then they both equally exist in the mind, and in that sense are alike *ideas*.

35. I do not argue against the existence of any one thing that we can apprehend either by sense or reflection. That the things I see with my eyes and touch with my hands do exist, really exist, I make not the least question. The only thing whose existence we deny is that which *Philosophers* call Matter or corporeal substance. And in doing of this there is no damage done to the rest of mankind, who, I dare say, will never miss it. The Atheist indeed will want the colour of an empty name to support his impiety; and the Philosophers may possibly find they have lost a great handle for trifling and disputation.

36. If any man thinks this detracts from the existence or reality of things, he is very far from understanding what hath been premised in the plainest terms I could think of. Take here an abstract of what has been said: - There are spiritual substances, minds, or human souls, which will or excite ideas in themselves at pleasure; But these are faint, weak, and unsteady in respect of others they perceive by Sense - which, Being impressed upon them according to certain Rules or laws of Nature, speak themselves the effects of a Mind more powerful and wise than human spirits. These latter are said to have *more reality* in them than the former; - by which is meant that they are more affecting, orderly, and distinct, and that they are not fictions of the mind perceiving them. And in this sense the sun that I see by day is the real sun, and that which I imagine by night is the idea of the former. In the sense here given of *reality*, it is evident that every vegetable star, mineral, and in general each part of the mundane system, is as much a *real being* by our principles as by any other whether others mean anything by the term reality different from what I do, I entreat them to look into their own thoughts and see.

37. It will be urged that thus much at least is true, to wit, that we take away all corporeal substances. To this my answer is, that if the word *substance* be taken in the vulgar sense - for a *combination* of sensible qualities, such as extension, solidity, weight, and the like - this we cannot be accused of taking away; but if it be taken in a philosophic sense - for the support of accidents or qualities without the mind - then indeed I acknowledge that we take it away, if one maybe said to take away that which never had any existence, not even in the imagination.

38. But after all, say you, it sounds very harsh to say we eat and drink ideas, and are clothed with ideas I acknowledge it does so - the word *idea* not being used in common discourse to signify the several combinations of sensible qualities which are called *things*; and it is certain that any expression which varies from the familiar use of language will seem harsh and ridiculous. But this doth not concern the truth of the proposition, which in other words is no more than to say, we are fed and clothed with those things which we perceive immediately by

our senses. The hardness or softness, the colour, taste, warmth, figure, or suchlike qualities, which, combined together, constitute the several sorts of victuals and apparel, have been shewn to exist only in the mind that perceives them; and this is all that is meant by calling them *ideas*; which word, if it was as ordinarily used as *thing*, would sound no harsher nor more ridiculous than it. I am not for disputing about the propriety, but the truth of the expression. If therefore you agree with me that we eat and drink and are clad with the immediate objects of sense, which cannot exist unperceived or without the mind, I shall readily grant it is more proper or conformable to custom that they should be called *things* rather than *ideas*.

39. If it be demanded why I make use of the word *idea*, and do not rather in compliance with custom call them *things*; I answer, I do it for two reasons - first, because the term *thing*, in contradistinction to *idea*, is generally supposed to denote somewhat existing without the mind; secondly, because *thing* hath a more comprehensive signification than *idea*, including spirit or thinking things as well as ideas. Since therefore the objects of sense exist only in the mind, and are withal thoughtless and inactive, I choose to mark them by the word *idea*, which implies those properties.

40. But, say what we can, some one perhaps may be apt to reply, he will still believe his senses, and never suffer any arguments, how plausible soever, to prevail over the certainty of them. Be it so; assert the evidence of sense as high as you please, we are willing to do the same. That what I see, hear, and feel doth exist, that is to say, is perceived by me, I no more doubt than I do of my own being. But I do not see how the testimony of *sense* can be alleged as a proof for the existence of anything which is *not* perceived by sense. We are not for having any man turn sceptic and disbelieve his senses; on the contrary, we give them all the stress and assurance imaginable; nor are there any principles more opposite to Scepticism than those we have laid down, as shall be hereafter clearly shewn.

41. *Secondly*, it will be objected that there is a great difference betwixt real fire for instance, and the idea of fire, betwixt dreaming or imagining oneself burnt, and actually being so: if you suspect it to be only the idea of fire which you see, do but put your hand into it and you will be convinced with a witness. This and the like may be urged in opposition to our tenets. To all which the answer is evident from what hath been already said, and I shall only add in this place, that if real fire be very different from the idea of fire, so also is the real pain that it occasions very different from the idea of the same pain; and yet nobody will pretend that real pain either is, or can possibly be, in an unperceiving thing, or without the mind, any more than its idea.

42. *Thirdly*, it will be objected that we see things actually without or at a distance from us, and which consequently do not exist in the mind; it being absurd that those things which are seen at the distance of several miles should be as near to us as our own thoughts. In answer to this, I desire it may be considered that in a dream we do oft perceive things as existing at a great distance off, and yet for all that, those things are acknowledged to have their existence only in the mind.

43. But, for the fuller clearing of this point, it may be worth while to consider *how* it is that we perceive distance and things placed at a distance by sight. For, that we should in truth see external space, and bodies actually existing in it - some nearer, and others farther off - seems to carry with it some opposition to what hath been said of their existing nowhere without the mind. The consideration of this difficulty it was that gave birth to my *Essay* towards a *New Theory of Vision*, which was published not long since - wherein it is shewn that *distance* or *outness* is neither immediately of itself perceived by sight, nor yet apprehended or judged of by lines and angles, or anything that hath a necessary connection with it; but that it is only suggested to our thoughts by certain visible ideas and sensations attending vision, which in their own nature have no manner of similitude or relation either with distance or things placed at a distance; but, by a connection taught us by experience, they come to signify and suggest them to us, after the same manner that words of any language suggest the ideas they are made to stand for; insomuch that a man from blind and afterwards made to see, would not, at first sight, think the things he saw to be without his mind, or at any distance from him See sect 41 of the forementioned treatise.

44. The ideas of sight and touch make two species entirely distinct and heterogeneous The former are marks and prognostics of the latter. That the proper objects of sight neither exist without the mind, nor are the images of external things, was shewn even in that treatise. Though throughout the same the contrary be supposed true of tangible objects - not that to suppose that vulgar error was necessary for establishing the notion therein laid down, but because it was beside my purpose to examine and refute it in a discourse concerning *Vision*. So that in strict truth the ideas of sight when we apprehend by them distance and things placed at a distance, do not suggest or mark out to us things actually existing at a distance, but only admonish us what ideas of touch will be imprinted in our minds at such and such distances of time, and in consequence of such and such actions. It is, I say, evident from what has been said in the foregoing parts of this treatise, and in sect 147 and elsewhere of the *Essay* concerning *Vision*, that visible ideas are the language whereby the governing Spirit on whom we depend no informs us what tangible ideas He is about to imprint upon us, in case we excite this or that motion in our own bodies But for a fuller information in this point I refer to the *Essay* itself.

45. *Fourthly*, it will be objected that from the foregoing principles it follows things are every moment annihilated and created anew. The objects of sense exist only when they are perceived; the trees therefore are in the garden, or the chairs in the parlour, no longer than while there is somebody by to perceive them. Upon shutting my eyes all the furniture in the room is reduced to nothing, and barely upon opening them it is again created - In answer to all which, I refer the reader to What has been said in sect 3, 4, &c, all I desire he will consider whether he *means* anything by the actual existence of an idea distinct from its being perceived. For my part, after the nicest inquiry I could make, I am not able to discover that anything else is meant by those words and I once more entreat the reader to sound his own thoughts, and not suffer himself to be imposed on by words. If he can conceive it possible either for his ideas or their archetypes to exist without being perceived, then I give up the cause; but if he cannot, he will acknowledge it is unreasonable for him to stand up in defence of he knows not what, and pretend to charge on me as an absurdity the not assenting to those propositions which at bottom have no meaning in them.

46. It will not be amiss to observe how far the received principles of philosophy are themselves chargeable with those pretended absurdities. It is thought strangely absurd that upon closing my eyelids all the visible objects around me should be reduced to nothing; and yet is not this what philosophers commonly acknowledge, when they agree on all hands that light and colours, which alone are the proper and immediate objects of sight, are mere sensations that exist no longer than they are perceived? Again, it may to some perhaps seem very incredible that things should be every moment creating, yet this very notion is commonly taught in the schools. For the Schoolmen, though they acknowledge the existence of matter, and that the whole mundane fabric is framed out of it, are nevertheless of opinion that it cannot subsist without the divine conservation, which by them is expounded to be a continual creation.

47. Farther, a little thought will discover to us that though we allow the existence of Matter or corporeal substances yet it will unavoidably follow, from the principles which are now generally admitted, that the particular bodies, of what kind soever, do none of them exist whilst they are not perceived. For, it is evident, from sect 11 and the following sections, that the Matter philosophers contend for is an incomprehensible somewhat, which hath none of those particular qualities whereby the bodies falling under our senses are distinguished one from another. But, to make this more plain, it must be remarked that the infinite divisibility of Matter is now universally allowed, at least by the most approved and considerable philosophers, who, on the received principles, demonstrate it beyond all exception. Hence, it follows there is an infinite number of parts in each particle of Matter which are not perceived by sense. The reason therefore that any particular body seems to be of a finite magnitude, or exhibits only a finite number of parts to sense, is, not because it contains no more, since in itself it contains an infinite number of parts, but because the sense is not acute enough to discern them. In proportion therefore as the sense is rendered more acute, it perceives a greater number of parts in the object, that is, the object appears greater, and its figure varies, those parts in its extremities which were before unperceivable appearing now to bound it in very different lines and angles from those perceived by an obtuser sense. And at length, after various changes of size and shape, when the sense becomes infinitely acute the body shall seem infinite During all which there is no alteration in the body, but only in the sense. Each body therefore, considered in itself, is infinitely extended, and consequently void of all shape and figure. - From which it follows that, though we should grant the existence of Matter to be never so certain, yet it is withal as certain, the Materialists themselves are by their own principles forced to acknowledge, that neither the particular bodies perceived by sense, nor anything like them, exists without the mind. Matter, I say, and each particle thereof, is according to them infinite and shapeless, and it is the mind that frames all that variety of bodies which compose the visible world, any one whereof does not exist longer than it is perceived.

48. But, after all, if we consider it, the objection proposed in sect 45 will not be found reasonably charged on the principles we have premised, so as in truth to make an objection at all against our notions For, though we hold indeed the objects of sense to be nothing else but ideas which cannot exist unperceived, yet we may not hence conclude they have no existence except only while they are perceived by us; since there may be some other spirit that perceives them though we do not wherever bodies are slid to have no existence without the mind, I would not be understood to mean this or that particular mind, but *all minds whatsoever*. It does not therefore follow from the foregoing principles that bodies are annihilated and created every moment, or exist not at all during the intervals between *our* perception of them.

49. *Fifthly*, it may perhaps be objected that if extension and figure exist only in the mind, it follows that the mind is extended and figured; since extension is a mode or attribute which (to speak with the schools) is predicated of the *subject* in which it exists - I answer, those qualities are in the mind only as they are perceived by it - -that is, not by way of *mode* or *attribute*, but only by way of *idea*; and it no more follows the soul or mind is extended, because extension exists in it alone, than it does that it is red or blue, because those colours are on all hands acknowledged to exist in it, and nowhere else. As to what philosophers say of 'subject' and 'mode,' that seems very groundless and unintelligible. For instance, in this proposition - 'a die is hard, extended, and square,' they will have it that the word *die* denotes a subject or substance, distinct from the hardness, extension and figure

which are predicated of it, and in which they exist. This I cannot comprehend: to me a die seems to be nothing distinct from those things which are termed its modes or accidents. And, to say 'a die is hard, extended, and square' is not to attribute those qualities to a subject distinct from and supporting them, but only an explication of the meaning of the word *die*.

50. *Sixthly*, you will say there have been a great many things explained by matter and motion; take away these and you destroy the whole corpuscular philosophy, and undermine those mechanical principles which have been applied with so much success to account for the phenomena. In short, whatever advances have been made, either by ancient or modern philosophers, in the study of Nature do all proceed on the supposition that corporeal substance or Matter doth really exist - To this I answer that there is not any one phenomenon explained on that supposition which may not as well be explained without it, as might easily be made appear by an induction of particulars. To explain the phenomena, is all one as to shew. Why, upon such and such occasions, we are affected with such and such ideas. But how Matter should operate on a Spirit, or produce any idea in it, is what no philosopher will pretend to explain; it is therefore evident there can be no use of Matter in Natural Philosophy. Besides, they who attempt to account for things do it not by corporeal substance, but by figure, motion, and other qualities, which are in truth no more than mere ideas, and therefore cannot be the cause of anything, as hath been already shewn. See sect 25.

51. *Seventhly*, it will upon this be demanded whether it does not seem absurd to take away Natural Causes, and ascribe everything to the immediate operation of Spirits? We must no longer say upon these principles that fire heats, or water cools, but that a Spirit heats, and so forth. Would not a man be deservedly laughed at, who should talk after this manner? I answer, he would so, in such things we ought to 'think with the learned, and speak with the vulgar.' They who to demonstration are convinced of the truth of the Copernican system do nevertheless say 'the sun rises,' 'the sun sets,' or 'comes to the meridian;' and if they affected a contrary style in common talk it would without doubt appear very ridiculous. A little reflection on what is here said will make it manifest that the common use of language would receive no manner of alteration or disturbance from the admission of our tenets.

52. In the ordinary affairs of life, any phrases may be retained, so long as they excite in us proper sentiments or dispositions to act in such a manner as is necessary for our well-being, how false soever they may be if taken in a strict and speculative sense. Nay, this is unavoidable, Since, propriety being regulated by custom, language is suited to the received opinions, which are not always the truest. Hence it is impossible - even in the most rigid, philosophic reasonings - so far to alter the bent and genius of the tongue we speak as never to give a handle for cavillers to pretend difficulties and inconsistencies. But a fair and ingenuous reader will collect the sense from the scope and tenor and complexion of a discourse, making allowances for those inaccurate modes of speech which use has made inevitable.

53. As to the opinion that there are no corporeal Causes, this has been heretofore maintained by some of the Schoolmen, as it is of late by others among the modern philosophers, who, though they allow Matter to exist, yet will have God *alone* to be the immediate efficient cause of all things. These men saw that amongst all the objects of sense there was none which had any power or activity included in it; and that by consequence this was likewise true of whatever bodies *they* supposed to exist without the mind, like unto the immediate objects of sense. But then, that they should suppose an innumerable multitude of created beings, which they acknowledge are not capable of producing any one effect in nature, and which therefore are made to no manner of purpose, since God might have done everything as well without them - this I say, though we should allow it possible, must yet be a very unaccountable and extravagant supposition.

54. In the *eighth* place, the universal concurrent Assent of Mankind may be thought by some an invincible argument in behalf of Matter, or the existence of external things. Must we suppose the whole world to be mistaken? And if so, what cause can be assigned of so widespread and predominant an error? I answer, first, that, upon a narrow inquiry, it will not perhaps be found so many as is imagined do really believe the existence of Matter or things without the mind. Strictly speaking to believe that which involves a contradiction, or has no meaning in it, is impossible, and whether the foregoing expressions are not of that sort, I refer it to the impartial examination of the reader. In one sense, indeed, men may be said to believe that Matter exists; that is, they act as if the immediate cause of their sensations, which affects them every moment, and is so nearly present to them, were some senseless unthinking - being. But, that they should clearly apprehend any *meaning* marked by those words, and form thereof a settled speculative opinion is what I am not able to conceive. This is not the only instance wherein men impose upon themselves, by imagining they believe those propositions which they have often heard, though at bottom they have no meaning in them.

55. But secondly, though we should grant a notion to be never so universally and steadfastly adhered to, yet this is but a weak argument of its truth to whoever considers what a vast number of prejudices and false opinions are everywhere embraced with the utmost tenaciousness, by the unreflecting (which are the far greater) part of mankind. There was a time when the antipodes and motion of the earth were looked upon as monstrous

absurdities even by men of learning and if it be considered what a small proportion they bear to the rest of mankind, we shall find that at this day those notions have gained but a very inconsiderable footing in the world.

56. But it is demanded that we assign a Cause of this Prejudice, and account for its obtaining in the world. - To this I answer, that men knowing they perceived several ideas, whereof *they themselves* were not the authors - as not being excited from without nor depending on the operation of their wills this made them maintain those ideas or objects of perception had an existence independent of and without the mind, without ever dreaming that a contradiction was involved in those words. But, philosophers having plainly seen that the *immediate objects* of perception do not exist without the mind, they in some degree corrected the mistake of the vulgar, but at the same time run into another which seems no less absurd, to wit, that there are certain objects really existing without the mind, or having a subsistence distinct from being perceived, of which our ideas are only images or resemblances, imprinted by those objects on the mind. And this notion of the philosophers owes its origin to the same cause with the former, namely, their being conscious that *they* were not the authors of their own sensation, which they evidently knew were imprinted from without, and which therefore must have some cause distinct from the minds on which they are imprinted.

57. But why they should suppose the ideas of sense to be excited in us by things in their likeness, and not rather have recourse to Spirit which alone can act, may be accounted for, first, because they were not aware of the repugnancy there is, as well in supposing things like unto our ideas existing without, as in attributing to them power or activity. Secondly, because the Supreme Spirit which excites those ideas in our minds, is not marked out and limited to our view by any particular finite collection of sensible ideas, as human agents are by their size, complexion, limbs, and motions. And thirdly, because his operations are regular and uniform. Whenever the course of nature is interrupted by a miracle, men are ready to own the presence of a superior agent. But, when we see things go on in the ordinary course and concatenation, though it be an argument of the greatest wisdom, power, and goodness in their creator, is yet so constant and familiar to us that we do not think them the immediate effects of a FREE SPIRIT; especially since inconsistency and mutability in acting, though it be an imperfection, is looked on as a mark of *freedom*.

58. *Tenthly*, it will be objected that the notions we advance are inconsistent with several sound truths in Philosophy and Mathematics. For example, the motion of the earth is now universally admitted by astronomers as a truth grounded on the clearest and most convincing reasons. But, on the foregoing principles, there can be no such thing. For, motion being only an idea, it follows that if it be not perceived it *exists* not: but the motion of the earth is not perceived by sense. - I answer, that tenet, if rightly understood, will be found to agree with the principles we have premised; for, the question whether the earth moves or not amounts in reality to no more than this! to wit whether we have reason to conclude, from what has been observed by astronomers, that if we were placed in such and such circumstances, and such or such a position and distance both from the earth and sun, we should perceive the former to move among the choir of the planets, and appearing in all respects like one of them and this, by the established rules of nature which we have no reason to mistrust, is reasonably collected from the phenomena.

59. We may, from the experience we have had of the train and succession of ideas in our minds, often make, I will not say uncertain conjectures, but sure and well-grounded predictions concerning the ideas we shall be affected with pursuant to a great train of actions, and be enabled to pass a right judgment of what would have appeared to us, in case we were placed in circumstances very different from those we are in at present. Herein consists the knowledge of nature, which may preserve its use and certainty very consistently with what hath been said. It will be easy to apply this to whatever objections of the like sort may be drawn from the magnitude of the stars, or any other discoveries in astronomy or nature.

60. In the *eleventh* place, it will be demanded to what purpose serves that curious organisation of plants, and the animal mechanism in the parts of animals; might not vegetables grow, and shoot forth leaves and blossom and animals perform all their motions as well without as with all that variety of internal parts so elegantly contrived and put together; which, being ideas, have nothing powerful or operative in them, nor have any *necessary* connection with the effects ascribed to them? If it be a Spirit that immediately produces every effect by a *fiat* or act of his will, we must think all that is fine and artificial in the works, whether of man or nature, to be made in vain. By this doctrine though an artist has made the spring and wheels, and every movement of a watch, and adjusted them in such a manner as he knew would produce the motions he designed, yet he must think all this is done to no purpose, and that it is an intelligence which directs the index, and points to the hour of the day. If so, why may not the Intelligence do it without his being at the pains of making the movements and putting them together? Why does not an empty case serve as well as another? And how comes it to pass that whenever there is any fault in the going of a watch, there is some corresponding disorder to be found in the movements, which being mended by a skilful hand all is right again? The like may be said of all the Clockwork of Nature, great part whereof is so wonderfully fine and subtle as scarce to be discerned by the best microscope. In short, it will be asked, how, upon our principles, any tolerable account can be given, or any final cause assigned, of an

innumerable multitude of bodies and machines, framed with the most exquisite art, which, in the common philosophy have very apposite uses assigned them, and serve to explain abundance of phenomena?

61. To all which I answer, first, that though there were some difficulties relating to the administration of Providence, and the uses by it assigned to the several parts of nature which I could not solve by the foregoing principles, yet this objection would be of small weight against the truth and certainty of those things which may be proved *a priori*, with the utmost evidence and rigour of demonstration. Secondly, but neither are the received principles free from the like difficulties; for, it may still be demanded to what end God should take those roundabout methods of effecting things by instruments and machines, which no one can deny might have been effected by the mere command of His will without all that apparatus: nay, if we narrowly consider it, we shall find the objection may be retorted with greater force on those who hold the existence of those machines without the mind; for it has been made evident that solidity, bulk, figure, motion, and the like have no *activity* or *efficacy* in them, so as to be capable of producing any one effect in nature. See sect 25. Whoever therefore supposes them to exist (allowing the supposition possible) when they are not perceived does it manifestly to no purpose; since the only use that is assigned to them, as they exist unperceived, is that they produce those perceivable effects which in truth cannot be ascribed to anything but Spirit.

62. But, to come nigher the difficulty, it must be observed that though the fabrication of all those parts and organs be not absolutely necessary to the producing *any* effect, yet it is necessary to the producing of things *in a constant regular way according to the laws of nature*. There are certain general laws that run through the whole chain of natural effects these are learned by the observation and study of nature, and are by men applied as well to the framing artificial things for the use and ornament of life as to the explaining the various phenomena - which explanation consists only in shewing the conformity any particular phenomenon hath to the general laws of nature, or, which is the same thing, in discovering the *uniformity* there is in the production of natural effects; as will be evident to whoever shall attend to the several instances wherein philosophers pretend to account for appearances. That there is a great and conspicuous *use* in these regular constant methods of working observed by the Supreme Agent hath been shewn in sect 31. And it is no less visible that a particular size, figure, motion, and disposition of parts are necessary, though not absolutely to the producing any effect, yet to the producing it according to the standing mechanical laws of nature Thus, for instance, it cannot be denied that God, or the Intelligence that sustains and rules the ordinary course of things, might, if He were minded to produce a miracle, cause all the motions on the dial-plate of a watch, though nobody had ever made the movements and put them in it but yet, if He will act agreeably to the rules of mechanism - by Him for wise ends established and maintained in the creation - it is necessary that those actions of the watchmaker, whereby he makes the movements and rightly adjusts them, precede the production of the aforesaid motions; as also that any disorder in them be attended with the perception of some corresponding disorder in the movements, which being once corrected all is right again.

63. It may indeed on some occasions be necessary that the Author of nature display His overruling power in producing appearances out of the ordinary series of things. Such exceptions from the general rules of nature are proper to surprise and awe men into an acknowledgment of the Divine Being but then they are to be used but seldom, otherwise there is a plain reason why they fail of that effect. Besides, God seems to choose the convincing our reason of his attributes by the works of nature, which discover so much harmony and contrivance in their make, and are such plain indications of wisdom and beneficence in their Author, rather than to astonish us into a belief of His Being by anomalous and surprising events.

64. To set this matter in a yet clearer light, I shall observe that what has been objected in sect 60 amounts in reality to no more than this ideas are not anyhow and at random produced, there being a certain order and connection between them, like to that of cause and effect there are also several combinations of them made in a very regular and artificial manner, which seem like so many *instruments* in the hand of nature that, being hid as it were behind the scenes, have a secret operation in producing those appearances which are seen on the theatre of the world, being themselves discernible only to the curious eye of the philosophers. But, since one idea cannot be the cause of another, to what purpose is that connection? And, since those instruments - being barely *inefficacious perceptions* in the mind - are not subservient to the production of natural effects, it is demanded why they are made; or, in other words, what reason can be assigned why God should make us, upon a close inspection into his works, behold so great variety of ideas so artfully laid together, and so much according to rule; it not being credible that He would be at the expense (if one may so speak) of all that art and regularity to no purpose?

65. To all which my answer is, first, that the connection of ideas does not imply the relation of *cause* and *effect*, but only of a *mark* or *sign* with the *thing signified*. The fire which I see is not the cause of the pain I suffer upon my approaching it, but the mark that forewarns me of it. In like manner the noise that I hear is not the effect of this or that motion or collision of the ambient bodies, but the sign thereof. Secondly, the reason why ideas are formed into machines, that is, artificial and regular combinations, is the same with that for combining letters into

words. That a few original ideas may be made to signify a great number of effects and actions, it is necessary they be variously combined together. And, to the end their use be permanent and universal, these combinations must be made by *rule*, and with *wise contrivance*. By this means abundance of information is conveyed unto us concerning what we are to expect from such and such actions, and what methods are proper to be taken for the exciting such and such ideas - which in effect is all that I conceive to be distinctly meant when it is said that, by discerning the figure, texture, and mechanism of the inward parts of bodies, whether natural or artificial, we may attain to know the several uses and properties depending thereon, or the nature of the thing.

66. Hence, it is evident that those things which, under the motion of a cause co-operating or concurring to the production of effects, are altogether inexplicable, and run us into great absurdities, may be very naturally explained, and have a proper and obvious use assigned to them, when they are considered only as marks or signs for our information. And it is the searching after and endeavouring to understand this language (if I may so call it) of the Author of Nature, that ought to be the employment of the natural philosopher; and not the pretending to explain things by corporeal causes, which doctrine seems to have too much estranged the minds of men from that Active Principle, that supreme and wise Spirit 'in whom we live, move, and have our being'.

67. In the *twelfth* place, it may perhaps be objected that - though it be clear from what has been said that there can be no such thing as an inert, senseless, extended, solid, figured, moveable substance existing without the mind, such as philosophers describe. Matter, - yet, if any man shall leave out of his idea of matter the positive ideas of extension, figure, solidity and motion, and say that he means only by that word an inert, senseless substance, that exists without the mind or unperceived, which is the *occasion* of our ideas, or at the presence whereof God is pleased to excite ideas in us - it doth not appear but that Matter taken in this sense may possibly exist. - In answer to which I say, first, that it seems no less absurd to suppose a substance without accidents, than it is to suppose accidents without a substance. But secondly, though we should grant this unknown substance may possibly exist, yet *where* can it be supposed to be? That it exists not in the *mind* is agreed; and that it exists not in *place* is no less certain - since all place or extension exists only in the mind, as hath been already proved. It remains therefore that it exists nowhere at all.

68. Let us examine a little the description that is here given us of *Matter*. It neither acts, nor perceives, nor is perceived; for this is all that is meant by saying it is an inert, senseless, unknown substance; which is a definition entirely made up of negatives, excepting only the relative notion or its standing under or supporting. But then it must be observed that it supports nothing at all, and how nearly this comes to the description of a *nonentity* I desire may be considered. But, say you, it is the *unknown occasion*, at the presence of which ideas are excited in us by the will of God. Now, I would fain know how anything can be present to us, which is neither perceivable by sense nor reflection, nor capable of producing any idea in our minds, nor is at all extended, nor hath any form, nor exists in any place. The words 'to be present,' when thus applied, must needs be taken in some abstract and strange meaning, and which I am not able to comprehend.

69. Again, let us examine what is meant by *occasion*. So far as I can gather from the common use of language, that word signifies either the agent which produces any effect, or else something that is observed to accompany or go before it in the ordinary course of things. But when it is applied to Matter as above described, it can be taken in neither of these senses; for Matter is said to be passive and inert, and so cannot be an agent or efficient cause. It is also unperceivable, as being devoid of all sensible qualities, and so cannot be the occasion of our perceptions in the latter sense - as when the burning my finger is said to be the occasion of the pain that attends it. What therefore can be meant by calling Matter an *occasion*? This term is either used in no sense at all, or else in some very distant from its received signification.

70. You will perhaps say that Matter, though it be not perceived by us, is nevertheless perceived by God, to whom it is the occasion of exciting ideas in our minds. For, say you, since we observe our sensations to be imprinted in an orderly and constant manner, it is but reasonable to suppose that there are certain constant and regular occasions of their being produced. That is to say, that there are certain permanent and distinct parcels of Matter, corresponding to our ideas, which, though they do not excite them in our minds, or anywise immediately affect us, as being altogether passive and unperceivable to *us*, they are nevertheless to God, *by whom they are perceived*, as it were so many occasions to remind him when and what ideas to imprint on our minds - that so things may go on in a constant uniform manner.

71. In answer to this, I observe that, as the notion of Matter is here stated, the question is no longer concerning the existence of a thing distinct from *Spirit* and *idea*, from perceiving and being perceived; but whether there are not certain Ideas, of I know not what sort, in the mind of God which are so many marks or notes that direct him how to produce sensations in our minds in a constant and regular method - much after the same manner as a musician is directed by the notes of music to produce that harmonious strain and composition of sound which is called a tune though they who hear the music do not perceive the notes, and may be entirely ignorant of them. But, this notion of Matter (which after all is the only intelligible one that I can pick from what is said of unknown occasions) seems too extravagant to deserve a confutation.

Besides, it is in effect no objection against what we have advanced, viz that there is no *senseless unperceived* substance.

72. If we follow the light of reason, we shall, from the constant uniform method of our sensations, collect the goodness and wisdom of the Spirit who excites them in our minds; but this is all that I can see reasonably concluded from thence. To me, I say, it is evident that the being of a Spirit infinitely wise, good, and powerful is abundantly sufficient to explain all the appearances of nature. But, as for *inert, senseless Matter*; nothing that I perceive has any the least connection with it, or leads to the thoughts of it. And I would fain see any one explain any the meanest phenomenon in nature by it or shew any manner of reason, though in the lowest rank of probability, that he can have for its existence, or even make any tolerable sense or meaning of that supposition. For, as to its being an occasion, we have, I think, evidently shewn that with regard to us it is no occasion. It remains therefore that it must be, if at all, the occasion to God of exciting ideas in us; and what this amounts to we have just now seen.

73. It is worth while to reflect a little on the motives which induced men to suppose the existence of *material substance*; that so having observed the gradual ceasing and expiration of those motives or reasons, we may proportionally withdraw the assent that was grounded on them. First, therefore, it was thought that colour, figure, motion, and the rest of these sensible qualities or accidents, did really exist without the mind; and for this reason it seemed needful to suppose some unthinking *substratum* or substance wherein they did exist - since they could not be conceived to exist by themselves. Afterwards, in process of time, men being convinced that colours, sounds, and the rest of the sensible, *secondary* qualities had no existence without the mind, they stripped this *substratum* or material substance of those qualities - leaving only the *primary* ones, figure, motion, and suchlike, which they still conceived to exist without the mind, and consequently to stand in need of a material support. But, it having been shewn that none even of these can possibly exist otherwise than in a Spirit or Mind which perceives them, it follows that we have no longer any reason to suppose the being of Matter, nay, that it is utterly impossible that there should be any such thing - so long as that word is taken to denote an *unthinking substratum* of qualities or accidents wherein they exist without the mind.

74. But - though it be allowed by the Materialists themselves that Matter was thought of only for the sake of supporting accidents, and, the reason entirely ceasing, one might expect the mind should naturally, and without any reluctance at all, quit the belief of what was solely grounded thereon - yet the prejudice is riveted so deeply in our thoughts, that we can scarce tell how to part with it, and are therefore inclined, since the *thing* itself is indefensible at least to retain the *name*, which we apply to I know not what abstracted and indefinite notions of Being, or Occasion, though without any show of reason, at least so far as I can see. For, what is there on our part, or what do we perceive, amongst all the ideas, sensations, notions which are imprinted on our minds, either by sense or reflection, from whence may be inferred the existence of an inert, thoughtless, unperceived occasion? and, on the other hand, on the part of an All-sufficient Spirit, what call there be that should make us believe or even suspect He is directed by an inert occasion to excite ideas in our minds?

75. It is a very extraordinary instance of the force of prejudice and much to be lamented, that the mind of man retains so great a fondness, against all the evidence of reason, for a *stupid thoughtless Somewhat*, by the interposition whereof it would as it were screen itself from the Providence or God, and remove Him farther off from the affairs of the world. But, though we do the utmost we can to secure the belief of Matter; though, when reason forsakes us, we endeavour to support our opinion on the bare possibility of the thing, and though we indulge ourselves in the full scope of an imagination not regulated by reason to make out that poor possibility, yet the upshot of all is - that there are certain *unknown ideas in the mind of God*; for this, if anything, is all that I conceive to be meant by *occasion* with regard to God. And this at the bottom is no longer contending for the thing, but for the name.

76. Whether therefore there are such Ideas in the mind of God, and whether *they* may be called by the name Matter, I shall not dispute. But, if you stick to the notion of an unthinking substance or support of extension, motion, and other sensible qualities, then to me it is most evidently impossible there should be any such thing; since it is a plain repugnancy that those qualities should exist in or be supported by an unperceiving substance.

77. But, say you, though it be granted that there is no thoughtless support of extension and the other qualities or accidents which we perceive, yet there may perhaps be some inert, unperceiving substance or *substratum* of some other qualities, as incomprehensible to us as colours are to a man born blind, because we have not a sense adapted to them. But, if we had a new sense, we should possibly no more doubt of their existence than a blind man made to see does of the existence of light and colours. - I answer, first, if what you mean by the word *Matter* be only the *unknown* support of *unknown* qualities, it is no matter whether there is such a thing or no, since it no way concerns us; and I do not see the advantage there is in disputing about we know not *what*, and we know not *why*.

78. But, secondly, if we had a new sense it could only furnish us with new ideas or sensations; and then we should have the same reason against *their* existing in an unperceiving substance that has been already offered with relation to figure, motion, colour, and the like. 'Qualities,' as hath been shewn, are nothing else but sensations or ideas, which exist only in a *minds* perceiving them; and this is true not only of the ideas we are acquainted with at present, but likewise of all possible ideas whatsoever.

79. But, you will insist, what if I have no reason to believe the existence of Matter? what if I cannot assign any use to it or explain anything by it, or even conceive what is meant by that word? yet still it is no contradiction to say that Matter exists, and that this Matter is in general a *substance, occasion* of ideas; though indeed to go about to unfold the meaning or adhere to any particular explication of those words may be attended with great difficulties. I answer, when words are used without a meaning, you may put them together as you please without danger of running into a contradiction. You may say, for example, that twice two is equal to seven so long as you declare you do not take the words of that proposition in their usual acceptance but for marks of you know not what. And, by the same reason, you may say there is an *inert thoughtless substance without accidents* which is the occasion of our ideas. And we shall understand just as much by one proposition as the other.

80. In the *last* place, you will say, what if we give up the cause of *material Substance*, and stand to it that Matter is an unknown *Somewhat* - neither substance nor accident, spirit nor idea, inert, thoughtless, indivisible, immoveable, unextended, existing in no place ? I or, say you, whatever may be urged against *substance* or *occasion*, or any other positive or relative notion of Matter, hath no place at all, so long as this negative definition of Matter is adhered to - I answer, you may, if so it shall seem good, use the word 'Matter' in the same sense as other men use 'nothing', and so make those terms convertible in your style. For, after all, this is what appears to me to be the result of that definition - the parts whereof when I consider with attention, either collectively or separate from each other, I do not find that there is any kind of effect or impression made on my mind different from what is excited by the term *nothing*.

81. You will reply, perhaps, that in the aforesaid definition is included what doth sufficiently distinguish it from nothing - the positive abstract idea of *quiddity, entity* or *existence* I own, indeed, that those who pretend to the faculty of framing abstract general ideas do talk as if they had such an idea, which is, say they, the most abstract and general notion of all; that is, to me, the most incomprehensible of all others. That there are a great variety of spirits of different orders and capacities, whose faculties both in number and extent are far exceeding those the Author of my being has bestowed on me, I see no reason to deny. And for me to pretend to determine, by my own few, stinted, narrow inlets of perception, what ideas the inexhaustible power of the Supreme Spirit may imprint upon them were certainly the utmost folly and presumption - since there may be, for aught that I know, innumerable sorts of ideas or sensations, as different from one another, and from all that I have perceived, as colours are from sounds. But, how ready soever I may be to acknowledge the scantiness of my comprehension with regard to the endless variety of spirits and ideas that may possibly exist, yet for any one to pretend to a notion of Entity or Existence, *abstracted* from *spirit* and *idea*, from perceived and being perceived, is, I suspect, a downright repugnancy and trifling with words.

6. David Hume (1772)

An Enquiry Concerning Human Understanding

Source: *An Enquiry Concerning Human Understanding* (1772). Hackett Publ Co. 1993; Chapter on Cause and Effect.

Cause and Effect

Part I

All the objects of human reason or enquiry may naturally be divided into two kinds, to wit, relations of ideas, and matters of fact. Of the first kind are the sciences of geometry, algebra, and arithmetic, and in short, every affirmation which is either intuitively or demonstratively certain. That the square of the hypotenuse is equal to the square of the two sides, is a proposition which expresses a relation between these figures. That three times five is equal to the half of thirty, expresses a relation between these numbers.

Propositions of this kind are discoverable by the mere operation of thought, without dependence on what is anywhere existent in the universe. Though there never were a circle or triangle in nature, the truths demonstrated by Euclid would for ever retain their certainty and evidence.

Matters of fact, which are the second objects of human reason, are not ascertained in the same manner; nor is our evidence of their truth, however great, of a like nature with the foregoing. The contrary of every matter of fact is still possible, because it can never imply a contradiction, and is conceived by the mind with the same facility and distinctness, as if ever so conformable to reality. That the sun will not rise tomorrow is no less intelligible a proposition, and implies no more contradiction, than the affirmation, that it will rise. We should in vain, therefore, attempt to demonstrate its falsehood. Were it demonstratively false, it would imply a contradiction, and could never be distinctly conceived by the mind.

It may, therefore, be a subject worthy of curiosity, to enquire what is the nature of that evidence which assures us of any real existence and matter of fact, beyond the present testimony of our senses, or the records of our memory. This part of philosophy, it is observable, has been little cultivated, either by the ancients or moderns, and therefore our doubts and errors, in the prosecution of so important an enquiry, may be the more excusable, while we march through such difficult paths without any guide or direction. They may even prove useful, by exciting curiosity, and destroying that implicit faith and security, which is the bane of all reasoning and free enquiry. The discovery of defects in the common philosophy, if any such there be, will not, I presume, be a discouragement, but rather an incitement, as is usual, to attempt something more full and satisfactory than has yet been proposed to the public.

All reasonings concerning matter of fact seem to be founded on the relation of cause and effect. By means of that relation alone we can go beyond the evidence of our memory and senses. If you were to ask a man, why he believes any matter of fact, which is absent, (for instance, that his friend is in the country, or in France) he would give you a reason, and this reason would be some other fact, as a letter received from him, or the knowledge of his former resolutions and promises. A man finding a watch or any other machine in a desert island, would conclude that there had once been men on that island. All our reasonings concerning fact are of the same nature. And here it is constantly supposed that there is a connection between the present fact and that which is inferred from it. Were there nothing to bind them together, the inference would be entirely precarious. The hearing of an articulate voice and rational discourse in the dark assures us of the presence of some person. Why? Because these are the effects of the human make and fabric, and closely connected with it. If we anatomise all the other reasonings of this nature, we shall find that they are founded on the relation of cause and effect, and that this relation is either near or remote, direct or collateral. Heat and light are collateral effects of fire, and the one effect may justly be inferred from the other.

If we would satisfy ourselves, therefore, concerning the nature of that evidence, which assures us of matters of fact, we must enquire how we arrive at the knowledge of cause and effect.

I shall venture to affirm, as a general proposition, which admits of no exception, that the knowledge of this relation is not, in any instance, attained by reasonings a priori, but arises entirely from experience, when we find that any particular objects are constantly conjoined with each other. Let an object be presented to a man of ever so strong natural reason and abilities; if that object be entirely new to him, he will not be able, by the most accurate examination of its sensible qualities, to discover any of its causes or effects. Adam, though his rational faculties be supposed, at the very first, entirely perfect, could not have inferred from the fluidity and transparency of water that it would suffocate him, or from the light and warmth of fire that it would consume him. No object ever discovers, by the qualities which appear to the senses, either from the causes which produced it, or the effects which will arise from it; nor can our reason, unassisted by experience, ever draw any inference concerning real existence and matter of fact.

This proposition, that causes and effects are discoverable, not by reason but by experience, will readily be admitted with regard to such objects, as we remember to have once been altogether unknown to us, since we must be conscious of the utter inability, which we then lay under, of foretelling what would arise from them. Present two smooth pieces of marble to a man who has no tincture of natural philosophy: he will never discover that they will adhere together in such a manner as to require great force to separate them in a direct line, while they make so small a resistance to a lateral pressure. Such events, as bear little analogy to the common course of nature, are also readily confessed to be known only by experience, nor does any man imagine that the explosion of gunpowder, or the attraction of a lodestone, could ever be discovered by arguments a priori. In like manner, when an effect is supposed to depend upon an intricate machinery or secret structure of parts, we make no difficulty in attributing all our knowledge of it to experience. Who will assert that he can give the ultimate reason, why milk or bread is proper nourishment for a man, not for a lion or a tiger?

But the same truth may not appear, at first sight, to have the same evidence with regard to events, which have become familiar to us from our first appearance in the world, which bear a close analogy to the whole course of nature, and which are supposed to depend on the simple qualities of objects, without any secret structure of parts. We are apt to imagine that we could discover these effects by the mere operation of our reason, without experience. We fancy, that were we brought on a sudden into this world, we could at first have inferred that one billiard ball would communicate motion to another upon impulse, and that we needed not to have waited for the event, in order to pronounce with certainty concerning it. Such is the influence of custom, that, where it is strongest, it not only covers our natural ignorance but even conceals itself, and seems not to take place, merely because it is found in the highest degree.

But to convince us that all the laws of nature, and all the operations of bodies without exception, are known only by experience, the following reflections may, perhaps, suffice. Were any object presented to us, and were we required to pronounce concerning the effect, which will result from it, without consulting past observation, after what manner, I beseech you, must the mind proceed in this operation? It must invent or imagine some event, which it ascribes to the object as its effect, and it is plain that this invention must be entirely arbitrary. The mind can never possibly find the effect in the supposed cause, by the most accurate scrutiny and examination. For the effect is totally different from the cause, and consequently can never be discovered in it. Motion in the second billiard ball is a quite distinct event from the motion in the first. nor is there anything in the one to suggest the smallest hint of the other. A stone or piece of metal raised into the air, and left without any support. immediately falls: but to consider the matter a priori. is there anything we discover in this situation which can beget the idea of a downward, rather than an upward, or any other motion, in the stone or metal?

And as the first imagination or invention of a particular effect, in all natural operations, is arbitrary, where we consult not experience, so must we also esteem the supposed tie or connection between the cause and effect, which binds them together, and renders it impossible that any other effect could result from the operation of that cause. When I see, for instance, a billiard ball moving in a straight line towards another; even suppose motion in the second ball should by accident be suggested to me, as the result of their contact or impulse, may I not conceive, that a hundred different events might as well follow from the cause? May not both these balls remain at absolute rest? May not the first ball return in a straight line, or leap off from the second in any line or direction? All these suppositions are consistent and conceivable. Why then should we give the preference to one, which is no more consistent or conceivable than the rest? All our reasonings a priori will never be able to show us any foundation for this preference.

In a word, then, every effect is a distinct event from its cause. It could not, therefore, be discovered in the cause, and the first invention or conception of it, a priori, must be entirely arbitrary. And even after it is suggested, the conjunction of it with the cause must appear equally arbitrary, since there are always many other effects, which, to reason, must seem fully as consistent and natural. In vain, therefore, should we pretend to determine any single event, or infer any cause or effect, without the assistance of observation and experience.

Hence we may discover the reason why no philosopher, who is rational and modest, has ever pretended to assign the ultimate cause of any natural operation, or to show distinctly the action of that power, which produces any single effect in the universe. It is confessed, that the utmost effort of human reason is to reduce the principles, productive of natural phenomena, to a greater simplicity, and to resolve the many particular effects into a few general causes, by means of reasonings from analogy, experience, and observation. But as to the causes of these general causes, we should in vain attempt their discovery, nor shall we ever be able to satisfy ourselves, by any particular explication of them. These ultimate springs and principles are totally shut up from human curiosity and enquiry.

Elasticity, gravity, cohesion of parts, communication of motion by impulse: These are probably the ultimate causes and principles which we shall ever discover in nature, and we may esteem ourselves sufficiently happy, if, by accurate enquiry and reasoning, we can trace up the particular phenomena to, or near to, these general principles. The most perfect philosophy of the natural kind only staves off our ignorance a little longer, as perhaps the most perfect philosophy of the moral or metaphysical kind serves only to discover larger portions of it. Thus the observation of human blindness and weakness is the result of all philosophy, and meets us at every turn, in spite of our endeavours to elude or avoid it.

Nor is geometry, when taken into the assistance of natural philosophy, ever able to remedy this defect, or lead us into the knowledge of ultimate causes, by all that accuracy of reasoning for which it is so justly celebrated. Every part of mixed mathematics proceeds upon the supposition that certain laws are established by nature in her operations, and abstract reasonings are employed, either to assist experience in the discovery of these laws, or to determine their influence in particular instances, where it depends upon any precise degree of distance and quantity. Thus, it is a law of motion, discovered by experience, that the moment of force of any body in motion is in the compound ratio or proportion of its solid contents and its velocity, and consequently, that a small force may remove the greatest obstacle or raise the greatest weight, if, by any contrivance or machinery, we can increase the velocity of that force, so as to make it an overmatch for its antagonist. Geometry assists us in the application of this law, by giving us the just dimensions of all the parts and figures which can enter into any species of machine; but still the discovery of the law itself is owing merely to experience, and all the abstract reasonings in the world could never lead us one step towards the knowledge of it. When we reason a priori, and consider merely any object or cause, as it appears to the mind, independent of all observation, it never could suggest to us the notion of any distinct object, such as its effect, much less show us the inseparable and inviolable connection between them. A man must be very sagacious who could discover by reasoning that crystal is the effect of heat, and ice of cold, without being previously acquainted with the operation of these qualities.

Part II

But we have not yet attained any tolerable satisfaction with regard to the question first proposed. Each solution still gives rise to a new foundation. It is allowed on all hands that there is no known connection between the sensible qualities and the secret powers; and consequently, that the mind is not led to form such a conclusion concerning their constant and regular conjunction, by anything which it knows of their nature. As to past experience, it can be allowed to give direct and certain information of those precise objects only, and that precise period of time, which fell under its cognisance; but why this experience should be extended to future times, and to other objects, which for aught we know, may be only in appearance similar-this is the main question on which I would insist. The bread, which I formerly ate, nourished me: that is, a body of such sensible qualities was, at that time, endued with such secret powers; but does it follow, that other bread must also nourish me at another time, and that like sensible qualities must always be attended with like secret powers? The consequence seems nowise necessary. At least, it must be acknowledged that there is here a consequence drawn by the mind, that there is a certain step taken-a process of thought, and an inference, which wants to be explained. These two propositions are far from being the same: I have found that such an object has always been attended with such an effect, and I foresee, that other objects, which are, in appearance, similar, will be attended with similar effects. I shall allow, if you please, that the one proposition may justly be inferred from the other; I know, in fact, that it always is inferred. But if you insist that the inference is made by a chain of

reasoning, I desire you to produce that reasoning. The connection between these propositions is not intuitive. There is required a medium, which may enable the mind to draw such an inference, if indeed it be drawn by reasoning and argument. What that medium is, I must confess, passes my comprehension, and it is incumbent on those to produce it, who assert that it really exists, and is the origin of all our conclusions concerning matter of fact.

This negative argument must certainly, in process of time, become altogether convincing. If many penetrating and able philosophers shall turn their enquiries this way and no one be ever able to discover any connecting proposition or intermediate step, which supports the understanding in this conclusion. But as the question is yet new, every reader may not trust so far to his own penetration, as to conclude, because an argument escapes his enquiry, that therefore it does not really exist. For this reason it may be requisite to venture upon a more difficult task, and enumerating all the branches of human knowledge, endeavour to show that none of them can afford such an argument.

All reasonings may be divided into two kinds, namely, demonstrative reasoning or that concerning relations of ideas, and moral reasoning, or that concerning matter of fact and existence. That there are no demonstrative arguments in the case seems evident; since it implies no contradiction that the course of nature may change, and that an object, seemingly like those which we have experienced, may be attended with different or contrary effects. May I not clearly and distinctly conceive that a body, falling from the clouds, and which, in all other respects, resembles snow, has yet the taste of salt or feeling of fire? Is there any more intelligible proposition than to affirm, that all the trees will flourish in December and January, and decay in May and June? Now whatever is intelligible, and can be distinctly conceived, implies no contradiction, and can never be proved false by any demonstrative argument or abstract reasoning a priori.

If we be, therefore, engaged by arguments to put trust in past experience, and make it the standard of our future judgement, these arguments must be probable only, or such as regard matter of fact and real existence, according to the division above mentioned. But that there is no argument of this kind, must appear, if our explication of that species of reasoning be admitted as solid and satisfactory. We have said that all arguments concerning existence are founded on the relation of cause and effect, that our knowledge of that relation is derived entirely from experience, and that all our experimental conclusions proceed upon the supposition that the future will be conformable to the past. To endeavour, therefore, the proof of this last supposition by probable arguments, or arguments regarding existence, must be evidently going in a circle, and taking that for granted, which is the very point in question.

In reality, all arguments from experience are founded on the similarity which we discover among natural objects, and by which we are induced to expect effects similar to those which we have found to follow from such objects. And though none but a fool or madman will ever pretend to dispute the authority of experience, or to reject that great guide of human life, it may surely be allowed a philosopher to have so much curiosity at least as to examine the principle of human nature, which gives this mighty authority to experience, and makes us draw advantage from that similarity which nature has placed among different objects. From causes which appear similar we expect similar effects. This is the sum of all our experimental conclusions. Now it seems evident that, if this conclusion were formed by reason, it would be as perfect at first, and upon one instance, as after ever so long a course of experience. But the case is far otherwise. Nothing so like as eggs; yet no one, on account of this appearing similarity, expects the same taste and relish in all of them. It is only after a long course of uniform experiments in any kind, and we attain a firm reliance and security with regard to a particular event. Now where is that process of reasoning which, from one instance, draws a conclusion so different from that which it infers from a hundred instances that are nowise different from that single one? This question I propose as much for the sake of information, as with an intention of raising difficulties. I cannot find, I cannot imagine any such reasoning. But I keep my mind still open to instruction, if any one will vouchsafe to bestow it on me.

Should it be said that, from a number of uniform experiments, we infer a connection between the sensible qualities and the secret powers: this, I must confess, seems the same difficulty, couched in different terms. The question still recurs, on what process of argument this inference is founded? Where is the medium, the interposing ideas, which join propositions so very wide of each other? It is confessed that the colour, consistence, and other sensible qualities of bread appear not, of themselves, to have any connection with the secret powers of nourishment and support. For otherwise we could infer these secret powers from the first appearance of these sensible qualities, without the aid of experience, contrary to the sentiment of all philosophers, and contrary to plain matter of fact. Here, then, is our natural state of ignorance with regard to the

powers and influence of all objects. How is this remedied by experience? It only shows us a number of uniform effects, resulting from certain objects, and teaches us that those particular objects, at that particular time, were endowed with such powers and forces. When a new object, endowed with similar sensible qualities, is produced, we expect similar powers and forces, and look for a like effect. From a body of like colour and consistence with bread we expect like nourishment and support. But this surely is a step or progress of the mind, which wants to be explained. When a man says, "I have found, in all past instances, such sensible qualities conjoined with such secret powers," and when he says, "Similar sensible qualities will always be conjoined with similar secret powers," he is not guilty of a tautology, nor are these propositions in any respect the same. You say that the one proposition is an inference from the other. But you must confess that the inference is not intuitive, neither is it demonstrative. Of what nature is it, then? To say it is experimental, is begging the question. For all inferences from experience suppose, as their foundation, that the future will resemble the past, and that similar powers will be conjoined with similar sensible qualities. If there be any suspicion that the course of nature may change, and that the past may be no rule for the future, all experience becomes useless, and can give rise to no inference or conclusion. It is impossible, therefore, that any arguments from experience can prove this resemblance of the past to the future, since all these arguments are founded on the supposition of that resemblance. Let the course of things be allowed hitherto ever so regular; that alone, without some new argument or inference, proves not that, for the future, it will continue so. In vain do you pretend to have learned the nature of bodies from your past experience. Their secret nature, and consequently all their effects and influence, may change, without any change in their sensible qualities. This happens sometimes, and with regard to some objects; why may it not happen always, and with regard to all objects? What logic, what process of argument secures you against this supposition? My practice, you say, refutes my doubts. But you mistake the purport of my question. As an agent, I am quite satisfied in the point; but as a philosopher, who has some share of curiosity, I will not say scepticism, I want to learn the foundation of this inference. No reading, no enquiry has yet been able to remove my difficulty, or give me satisfaction in a matter of such importance. Can I do better than propose the difficulty to the public, even though, perhaps, I have small hopes of obtaining a solution? We shall at least, by this means, be sensible of our ignorance, if we do not augment our knowledge.

I must confess that a man is guilty of unpardonable arrogance who concludes, because an argument has escaped his own investigation, that therefore it does not really exist. I must also confess that, though all the learned, for several ages, should have employed themselves in fruitless search upon any subject, it may still, perhaps, be rash to conclude positively that the subject must, therefore, pass all human comprehension. Even though we examine all the sources of our knowledge, and conclude them unfit for such a project, there may still remain a suspicion, that the enumeration is not complete, or the examination not accurate. But with regard to the present subject, there are some considerations which seem to remove all this accusation of arrogance or suspicion of mistake.

It is certain that the most ignorant and stupid peasants-nay infants, nay even brute beasts-improve by experience, and learn the qualities of natural objects, by observing the effects which result from them. When a child has felt the sensation of pain from touching the flame of a candle, he will be careful not to put his hand near any candle, but will expect a similar effect from a cause which is similar in its sensible qualities and appearance. If you assert, therefore, that the understanding of the child is led into this conclusion by any process of argument or ratiocination, I may justly require you to produce that argument, nor have you any pretence to refuse so equitable a demand. You cannot say that the argument is abstruse, and may possibly escape your enquiry; since you confess that it is obvious to the capacity of a mere infant. If you hesitate, therefore, a moment, or if, after reflection, you produce any intricate or profound argument, you, in a manner, give up the question, and confess that it is not reasoning which engages us to suppose the past resembling the future, and to expect similar effects from causes which are, to appearance, similar. This is the proposition which I intended to enforce in the present section. If I be right, I pretend not to have made any mighty discovery. And if I be wrong, I must acknowledge myself to be indeed a very backward scholar, since I cannot now discover an argument which, it seems, was perfectly familiar to me long before I was out of my cradle.