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this argument, neither of which is, in my opinion, satisfactory. The first is, that the objects of geometry, those surfaces, lines, and points, whose proportions and positions it examines, are mere ideas in the mind; and not only never did, but never can exist in nature. They never did exist; for no one will pretend to draw a line or make a surface entirely conformable to the definition: they never can exist; for we may produce demonstrations from these very ideas to prove that they are impossible.

But can any thing be imagined more absurd and contradictory than this reasoning? Whatever can be conceived by a clear and distinct idea, necessarily implies the possibility of existence; and he who pretends to prove the impossibility of its existence by any argument derived from the clear idea, in reality asserts that we have no clear idea of it, because we have a clear idea. 'Tis in vain to search for a contradiction in any thing that is distinctly conceived by the mind. Did it imply any contradiction, 'tis impossible it could ever be conceived.

There is therefore no medium betwixt allowing at least the possibility of indivisible points, and denying their idea; and 'tis on this latter principle that the second answer to the foregoing argument is founded. It has been pretended, * that though it be impossible to conceive a length without any breadth, yet by an abstraction without a separation we can consider the one without regarding the other; in the same manner as we may think of the length of the way betwixt two towns and overlook its breadth. The length is inseparable from the breadth both in nature and in our

* L'Art de penser.

minds; but this excludes not a partial consideration, and a *distinction of reason*, after the manner above explained.

In refuting this answer I shall not insist on the argument, which I have already sufficiently explained, that if it be impossible for the mind to arrive at a *minimum* in its ideas, its capacity must be infinite in order to comprehend the infinite number of parts, of which its idea of any extension would be composed. I shall here endeavour to find some new absurdities in this reasoning.

A surface terminates a solid; a line terminates a surface; a point terminates a line; but I assert, that if the *ideas* of a point, line, or surface, were not indivisible, 'tis impossible we should ever conceive these terminations. For let these ideas be supposed infinitely divisible, and then let the fancy endeavour to fix itself on the idea of the last surface, line, or point, it immediately finds this idea to break into parts; and upon its seizing the last of these parts it loses its hold by a new division, and so on *in infinitum*, without any possibility of its arriving at a concluding idea. The number of fractions bring it no nearer the last division than the first idea it formed. Every particle eludes the grasp by a new fraction, like quicksilver, when we endeavour to seize it. But as in fact there must be something which terminates the idea of every finite quantity, and as this terminating idea cannot itself consist of parts or inferior ideas, otherwise it would be the last of its parts, which finished the idea, and so on; this is a clear proof, that the ideas of surfaces, lines, and points, admit not of any division; those of surfaces in depth, of lines in breadth and depth, and of points in any dimension.

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The *schoolmen* were so sensible of the force of this argument, that some of them maintained that nature has mixed among those particles of matter, which are divisible *in infinitum*, a number of mathematical points in order to give a termination to bodies; and others eluded the force of this reasoning by a heap of unintelligible cavils and distinctions. Both these adversaries equally yield the victory. A man who hides himself confesses as evidently the superiority of his enemy, as another, who fairly delivers his arms.

Thus it appears, that the definitions of mathematics destroy the pretended demonstrations; and that if we have the idea of indivisible points, lines, and surfaces, conformable to the definition, their existence is certainly possible; but if we have no such idea, 'tis impossible we can ever conceive the termination of any figure, without which conception there can be no geometrical demonstration.

But I go farther, and maintain, that none of these demonstrations can have sufficient weight to establish such a principle as this of infinite divisibility; and that because with regard to such minute objects, they are not properly demonstrations, being built on ideas which are not exact, and maxims which are not precisely true. When geometry decides any thing concerning the proportions of quantity, we ought not to look for the utmost *precision* and exactness. None of its proofs extend so far: it takes the dimensions and proportions of figures justly; but roughly, and with some liberty. Its errors are never considerable, nor would it err at all, did it not aspire to such an absolute perfection.

I first ask mathematicians what they mean when they say one line or surface is *equal* to, or *greater*, or *less*

than another? Let any of them give an answer, to whatever sect he belongs, and whether he maintains the composition of extension by indivisible points, or by quantities divisible *in infinitum*. This question will embarrass both of them.

There are few or no mathematicians who defend the hypothesis of indivisible points, and yet these have the readiest and justest answer to the present question. They need only reply, that lines or surfaces are equal, when the numbers of points in each are equal; and that as the proportion of the numbers varies, the proportion of the lines and surfaces is also varied. But though this answer be *just* as well as obvious, yet I may affirm, that this standard of equality is entirely *useless*, and that it never is from such a comparison we determine objects to be equal or unequal with respect to each other. For as the points which enter into the composition of any line or surface, whether perceived by the sight or touch, are so minute and so confounded with each other that 'tis utterly impossible for the mind to compute their number, such a computation will never afford us a standard, by which we may judge of proportions. No one will ever be able to determine by an exact enumeration, that an inch has fewer points than a foot, or a foot fewer than an ell, or any greater measure; for which reason, we seldom or never consider this as the standard of equality or inequality.

As to those who imagine that extension is divisible *in infinitum*, 'tis impossible they can make use of this answer, or fix the equality of any line or surface by a numeration of its component parts. For since, according to their hypothesis, the least as well as greatest figures contain an infinite number of parts, and since infinite numbers, properly speaking, can neither be

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equal nor unequal with respect to each other, the equality or inequality of any portions of space can never depend on any proportion in the number of their parts. 'Tis true, it may be said, that the inequality of an ell and a yard consists in the different numbers of the feet of which they are composed, and that of a foot and a yard in the number of inches. But as that quantity we call an inch in the one is supposed equal to what we call an inch in the other, and as 'tis impossible for the mind to find this equality by proceeding *in infinitum* with these references to inferior quantities, 'tis evident that at last we must fix some standard of equality different from an enumeration of the parts.

There are some who pretend, * that equality is best defined by *congruity*, and that any two figures are equal, when upon the placing of one upon the other, all their parts correspond to and touch each other. In order to judge of this definition let us consider, that since equality is a relation, it is not, strictly speaking, a property in the figures themselves, but arises merely from the comparison which the mind makes betwixt them. If it consists therefore in this imaginary application and mutual contact of parts, we must at least have a distinct notion of these parts, and must conceive their contact. Now 'tis plain, that in this conception we would run up these parts to the greatest minuteness which can possibly be conceived, since the contact of large parts would never render the figures equal. But the minutest parts we can conceive are mathematical points, and consequently this standard of equality is the same with that derived from the equality of the number of points, which we have already determined

* See Dr Barrow's Mathematical Lectures.

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to be a just but an useless standard. We must therefore look to some other quarter for a solution of the present difficulty.

There are many philosophers, who refuse to assign any standard of *equality*, but assert, that 'tis sufficient to present two objects, that are equal, in order to give us a just notion of this proportion. All definitions, say they, are fruitless without the perception of such objects; and where we perceive such objects we no longer stand in need of any definition. To this reasoning I entirely agree; and assert, that the only useful notion of equality, or inequality, is derived from the whole united appearance and the comparison of particular objects.

'Tis evident that the eye, or rather the mind, is often able at one view to determine the proportions of bodies, and pronounce them equal to, or greater or less than each other, without examining or comparing the number of their minute parts. Such judgments are not only common, but in many cases certain and infallible. When the measure of a yard and that of a foot are presented, the mind can no more question, that the first is longer than the second, than it can doubt of those principles which are the most clear and self-evident.

There are therefore three proportions which the mind distinguishes in the general appearance of its objects, and calls by the names of *greater*, *less*, and *equal*. But though its decisions concerning these proportions be sometimes infallible, they are not always so; nor are our judgments of this kind more exempt from doubt and error than those on any other subject. We frequently correct our first opinion by a review and reflection; and pronounce those objects to be equal,

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which at first we esteemed unequal; and regard an object as less, though before it appeared greater than another. Nor is this the only correction which these judgments of our senses undergo; but we often discover our error by a juxta-position of the objects; or, where that is impracticable, by the use of some common and invariable measure, which, being successively applied to each, informs us of their different proportions. And even this correction is susceptible of a new correction, and of different degrees of exactness, according to the nature of the instrument by which we measure the bodies, and the care which we employ in the comparison.

When therefore the mind is accustomed to these judgments and their corrections, and finds that the same proportion which makes two figures have in the eye that appearance, which we call *equality*, makes them also correspond to each other, and to any common measure with which they are compared, we form a mixed notion of equality derived both from the looser and stricter methods of comparison. But we are not content with this. For as sound reason convinces us that there are bodies *vastly* more minute than those which appear to the senses; and as a false reason would persuade us, that there are bodies *infinitely* more minute, we clearly perceive that we are not possessed of any instrument or art of measuring which can secure us from all error and uncertainty. We are sensible that the addition or removal of one of these minute parts is not discernible either in the appearance or measuring; and as we imagine that two figures, which were equal before, cannot be equal after this removal or addition, we therefore suppose some imaginary standard of equality, by which the appearances and measur-

ing are exactly corrected, and the figures reduced entirely to that proportion. This standard is plainly imaginary. For as the very idea of equality is that of such a particular appearance, corrected by juxtaposition or a common measure, the notion of any correction beyond what we have instruments and art to make, is a mere fiction of the mind, and useless as well as incomprehensible. But though this standard be only imaginary, the fiction however is very natural; nor is any thing more usual, than for the mind to proceed after this manner with any action, even after the reason has ceased, which first determined it to begin. This appears very conspicuously with regard to time; where, though 'tis evident we have no exact method of determining the proportions of parts, not even so exact as in extension, yet the various corrections of our measures, and their different degrees of exactness, have given us an obscure and implicit notion of a perfect and entire equality. The case is the same in many other subjects. A musician, finding his ear become every day more delicate, and correcting himself by reflection and attention, proceeds with the same act of the mind even when the subject fails him, and entertains a notion of a complete *tierce* or *octave*, without being able to tell whence he derives his standard. A painter forms the same fiction with regard to colours; a mechanic with regard to motion. To the one *light* and *shade*, to the other *swift* and *slow*, are imagined to be capable of an exact comparison and equality beyond the judgments of the senses.

We may apply the same reasoning to *curve* and *right* lines. Nothing is more apparent to the senses than the distinction betwixt a curve and a right line; nor are there any ideas we more easily form than the

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ideas of these objects. But however easily we may form these ideas, 'tis impossible to produce any definition of them, which will fix the precise boundaries betwixt them. When we draw lines upon paper or any continued surface, there is a certain order by which the lines run along from one point to another, that they may produce the entire impression of a curve or right line; but this order is perfectly unknown, and nothing is observed but the united appearance. Thus, even upon the system of indivisible points, we can only form a distant notion of some unknown standard to these objects. Upon that of infinite divisibility we cannot go even this length, but are reduced merely to the general appearance, as the rule by which we determine lines to be either curve or right ones. But though we can give no perfect definition of these lines, nor produce any very exact method of distinguishing the one from the other, yet this hinders us not from correcting the first appearance by a more accurate consideration, and by a comparison with some rule, of whose rectitude, from repeated trials, we have a greater assurance. And 'tis from these corrections, and by carrying on the same action of the mind, even when its reason fails us, that we form the loose idea of a perfect standard to these figures, without being able to explain or comprehend it.

'Tis true, mathematicians pretend they give an exact definition of a right line when they say, *it is the shortest way betwixt two points.* But in the first place I observe, that this is more properly the discovery of one of the properties of a right line, than a just definition of it. For I ask any one, if, upon mention of a right line, he thinks not immediately on such a particular appearance, and if 'tis not by accident only that

he considers this property? A right line can be comprehended alone; but this definition is unintelligible without a comparison with other lines, which we conceive to be more extended. In common life 'tis established as a maxim, that the straightest way is always the shortest; which would be as absurd as to say, the shortest way is always the shortest, if our idea of a right line was not different from that of the shortest way betwixt two points.

Secondly, I repeat, what I have already established, that we have no precise idea of equality and inequality, shorter and longer, more than of a right line or a curve; and consequently that the one can never afford us a perfect standard for the other. An exact idea can never be built on such as are loose and undeterminate.

The idea of a *plain surface* is as little susceptible of a precise standard as that of a right line; nor have we any other means of distinguishing such a surface, than its general appearance. 'Tis in vain that mathematicians represent a plain surface as produced by the flowing of a right line. 'Twill immediately be objected, that our idea of a surface is as independent of this method of forming a surface, as our idea of an ellipse is of that of a cone; that the idea of a right line is no more precise than that of a plain surface; that a right line may flow irregularly, and by that means form a figure quite different from a plane; and that therefore we must suppose it to flow along two right lines, parallel to each other, and on the same plane; which is a description that explains a thing by itself, and returns in a circle.

It appears then, that the ideas which are most es-

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sential to geometry, viz. those of equality and inequality, of a right line and a plain surface, are far from being exact and determinate, according to our common method of conceiving them. Not only we are incapable of telling if the case be in any degree doubtful, when such particular figures are equal; when such a line is a right one, and such a surface a plain one; but we can form no idea of that proportion, or of these figures, which is firm and invariable. Our appeal is still to the weak and fallible judgment, which we make from the appearance of the objects, and correct by a compass, or common measure; and if we join the supposition of any farther correction, 'tis of such a one as is either useless or imaginary. In vain should we have recourse to the common topic, and employ the supposition of a Deity, whose omnipotence may enable him to form a perfect geometrical figure, and describe a right line without any curve or inflection. As the ultimate standard of these figures is derived from nothing but the senses and imagination, 'tis absurd to talk of any perfection beyond what these faculties can judge of; since the true perfection of any thing consists in its conformity to its standard.

Now, since these ideas are so loose and uncertain, I would fain ask any mathematician, what infallible assurance he has, not only of the more intricate and obscure propositions of his science, but of the most vulgar and obvious principles? How can he prove to me, for instance, that two right lines cannot have one common segment? Or that 'tis impossible to draw more than one right line betwixt any two points? Should he tell me, that these opinions are obviously absurd, and repugnant to our clear ideas; I would an-

swer, that I do not deny, where two right lines incline upon each other with a sensible angle, but 'tis absurd to imagine them to have a common segment. But supposing these two lines to approach at the rate of an inch in twenty leagues, I perceive no absurdity in asserting, that upon their contact they become one. For, I beseech you, by what rule or standard do you judge, when you assert that the line, in which I have supposed them to concur, cannot make the same right line with those two, that form so small an angle betwixt them? You must surely have some idea of a right line, to which this line does not agree. Do you therefore mean, that it takes not the points in the same order and by the same rule, as is peculiar and essential to a right line? If so, I must inform you, that besides that, in judging after this manner, you allow that extension is composed of indivisible points (which, perhaps, is more than you intend), besides this, I say, I must inform you, that neither is this the standard from which we form the idea of a right line; nor, if it were, is there any such firmness in our senses or imagination, as to determine when such an order is violated or preserved. The original standard of a right line is in reality nothing but a certain general appearance; and 'tis evident right lines may be made to concur with each other, and yet correspond to this standard, though corrected by all the means either practicable or imaginable.

To whatever side mathematicians turn, this dilemma still meets them. If they judge of equality, or any other proportion, by the accurate and exact standard, viz. the enumeration of the minute indivisible parts, they both employ a standard, which is useless in practice, and actually establish the indivisibility of exten-

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sion, which they endeavour to explode. Or if they employ, as is usual, the inaccurate standard, derived from a comparison of objects, upon their general appearance, corrected by measuring and juxtaposition; their first principles, though certain and infallible, are too coarse to afford any such subtile inferences as they commonly draw from them. The first principles are founded on the imagination and senses; the conclusion therefore can never go beyond, much less contradict, these faculties.

This may open our eyes a little, and let us see, that no geometrical demonstration for the infinite divisibility of extension can have so much force as what we naturally attribute to every argument, which is supported by such magnificent pretensions. At the same time we may learn the reason, why geometry fails of evidence in this single point, while all its other reasonings command our fullest assent and approbation. And indeed it seems more requisite to give the reason of this exception, than to show that we really must make such an exception, and regard all the mathematical arguments for infinite divisibility as utterly sophistical. For 'tis evident, that as no idea of quantity is infinitely divisible, there cannot be imagined a more glaring absurdity, than to endeavour to prove, that quantity itself admits of such a division; and to prove this by means of ideas, which are directly opposite in that particular. And as this absurdity is very glaring in itself, so there is no argument founded on it, which is not attended with a new absurdity, and involves not an evident contradiction.

I might give as instances those arguments for infinite divisibility, which are derived from the *point of contact*. I know there is no mathematician, who will

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not refuse to be judged by the diagrams he describes upon paper, these being loose draughts, as he will tell us, and serving only to convey with greater facility certain ideas, which are the true foundation of all our reasoning. This I am satisfied with, and am willing to rest the controversy merely upon these ideas. I desire therefore our mathematician to form, as accurately as possible, the ideas of a circle and a right line; and I then ask, if upon the conception of their contact he can conceive them as touching in a mathematical point, or if he must necessarily imagine them to concur for some space. Whichever side he chooses, he runs himself into equal difficulties. If he affirms, that in tracing these figures in his imagination, he can imagine them to touch only in a point, he allows the possibility of that idea, and consequently of the thing. If he says, that in his conception of the contact of those lines he must make them concur, he thereby acknowledges the fallacy of geometrical demonstrations, when carried beyond a certain degree of minuteness; since, 'tis certain he has such demonstrations against the concurrence of a circle and a right line; that is, in other words, he can prove an idea, viz. that of concurrence, to be *incompatible* with two other ideas, viz. those of a circle and right line; though at the same time he acknowledges these ideas to be *inseparable*.

SECTION V.

THE SAME SUBJECT CONTINUED.

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If the second part of my system be true, *that the idea of space or extension is nothing but the idea of visible or tangible points distributed in a certain order*, it follows, that we can form no idea of a vacuum, or space, where there is nothing visible or tangible. This gives rise to three objections, which I shall examine together, because the answer I shall give to one is a consequence of that which I shall make use of for the others.

First, it may be said, that men have disputed for many ages concerning a vacuum and a plenum, without being able to bring the affair to a final decision: and philosophers, even at this day, think themselves at liberty to take party on either side, as their fancy leads them. But whatever foundation there may be for a controversy concerning the things themselves, it may be pretended that the very dispute is decisive concerning the idea, and that 'tis impossible men could so long reason about a vacuum, and either refute or defend it, without having a notion of what they refuted or defended.

Secondly, if this argument should be contested, the reality, or at least possibility, of the *idea* of a vacuum, may be proved by the following reasoning. Every idea is possible which is a necessary and infallible consequence of such as are possible. Now, though we allow the world to be at present a plenum, we may easily conceive it to be deprived of motion; and this

idea will certainly be allowed possible. It must also be allowed possible, to conceive the annihilation of any part of matter by the omnipotence of the Deity, while the other parts remain at rest. For as every idea that is distinguishable is separable by the imagination, and as every idea that is separable by the imagination may be conceived to be separately existent, 'tis evident, that the existence of one particle of matter no more implies the existence of another, than a square figure in one body implies a square figure in every one. This being granted, I now demand what results from the concurrence of these two possible ideas of *rest* and *annihilation*, and what must we conceive to follow upon the annihilation of all the air and subtile matter in the chamber, supposing the walls to remain the same, without any motion or alteration? There are some metaphysicians who answer, that since matter and extension are the same, the annihilation of the one necessarily implies that of the other; and there being now no distance betwixt the walls of the chamber, they touch each other; in the same manner as my hand touches the paper which is immediately before me. But though this answer be very common, I defy these metaphysicians to conceive the matter according to their hypothesis, or imagine the floor and roof, with all the opposite sides of the chamber, to touch each other, while they continue in rest, and preserve the same position. For how can the two walls, that run from south to north, touch each other, while they touch the opposite ends of two walls that run from east to west? And how can the floor and roof ever meet, while they are separated by the four walls that lie in a contrary position? If you change their position, you suppose a motion. If you conceive any thing betwixt them, you

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suppose a new creation. But keeping strictly to the two ideas of *rest* and *annihilation*, 'tis evident, that the idea which results from them is not that of a contact of parts, but something else, which is concluded to be the idea of a vacuum.

The third objection carries the matter still farther, and not only asserts, that the idea of a vacuum is real and possible, but also necessary and unavoidable. This assertion is founded on the motion we observe in bodies, which, 'tis maintained, would be impossible and inconceivable without a vacuum, into which one body must move in order to make way for another. I shall not enlarge upon this objection, because it principally belongs to natural philosophy, which lies without our present sphere.

In order to answer these objections, we must take the matter pretty deep, and consider the nature and origin of several ideas, lest we dispute without understanding perfectly the subject of the controversy. 'Tis evident the idea of darkness is no positive idea, but merely the negation of light, or, more properly speaking, of coloured and visible objects. A man who enjoys his sight, receives no other perception from turning his eyes on every side, when entirely deprived of light, than what is common to him with one born blind; and 'tis certain such a one has no idea either of light or darkness. The consequence of this is, that 'tis not from the mere removal of visible objects we receive the impression of extension without matter; and that the idea of utter darkness can never be the same with that of vacuum.

Suppose again a man to be supported in the air, and to be softly conveyed along by some invisible power; 'tis evident he is sensible of nothing, and never re-

ceives the idea of extension, nor indeed any idea, from this invariable motion. Even supposing he moves his limbs to and fro, this cannot convey to him that idea. He feels in that case a certain sensation or impression, the parts of which are successive to each other, and may give him the idea of time, but certainly are not disposed in such a manner as is necessary to convey the idea of space or extension.

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Since, then, it appears that darkness and motion, with the utter removal of every thing visible and tangible, can never give us the idea of extension without matter, or of a vacuum; the next question is, whether they can convey this idea, when mixed with something visible and tangible?

'Tis commonly allowed by philosophers, that all bodies which discover themselves to the eye, appear as if painted on a plain surface, and that their different degrees of remoteness from ourselves are discovered more by reason than by the senses. When I hold up my hand before me, and spread my fingers, they are separated as perfectly by the blue colour of the firmament, as they could be by any visible object which I could place betwixt them. In order, therefore, to know whether the sight can convey the impression and idea of a vacuum, we must suppose, that amidst an entire darkness, there are luminous bodies presented to us, whose light discovers only these bodies themselves, without giving us any impression of the surrounding objects.

We must form a parallel supposition concerning the objects of our feeling. 'Tis not proper to suppose a perfect removal of all tangible objects: we must allow something to be perceived by the feeling; and after an interval and motion of the hand or other organ

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of sensation, another object of the touch to be met with; and upon leaving that, another; and so on, as often as we please. The question is, whether these intervals do not afford us the idea of extension without body?

To begin with the first case; 'tis evident, that when only two luminous bodies appear to the eye, we can perceive whether they be conjoined or separate; whether they be separated by a great or small distance; and if this distance varies, we can perceive its increase or diminution, with the motion of the bodies. But as the distance is not in this case any thing coloured or visible, it may be thought that there is here a vacuum or pure extension, not only intelligible to the mind, but obvious to the very senses.

This is our natural and most familiar way of thinking, but which we shall learn to correct by a little reflection. We may observe, that when two bodies present themselves, where there was formerly an entire darkness, the only change that is discoverable is in the appearance of these two objects, and that all the rest continues to be as before, a perfect negation of light, and of every coloured or visible object. This is not only true of what may be said to be remote from these bodies, but also of the very distance which is interposed betwixt them; *that* being nothing but darkness, or the negation of light; without parts, without composition, invariable and indivisible. Now, since this distance causes no perception different from what a blind man receives from his eyes, or what is conveyed to us in the darkest night, it must partake of the same properties; and as blindness and darkness afford us no ideas of extension, 'tis impossible that the dark

and undistinguishable distance betwixt two bodies can ever produce that idea.

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The same subject continued.

The sole difference betwixt an absolute darkness and the appearance of two or more visible luminous objects consists, as I said, in the objects themselves, and in the manner they affect our senses. The angles, which the rays of light flowing from them form with each other; the motion that is required in the eye, in its passage from one to the other; and the different parts of the organs which are affected by them; these produce the only perceptions from which we can judge of the distance. But as these perceptions are each of them simple and indivisible, they can never give us the idea of extension.

We may illustrate this by considering the sense of feeling, and the imaginary distance or interval interposed betwixt tangible or solid objects. I suppose two cases, viz. that of a man supported in the air, and moving his limbs to and fro, without meeting any thing tangible; and that of a man, who, feeling something tangible, leaves it, and, after a motion of which he is sensible, perceives another tangible object; and I then ask, wherein consists the difference betwixt these two cases? No one will make any scruple to affirm, that it consists merely in the perceiving those objects, and that the sensation, which arises from the motion, is in both cases the same; and as that sensation is not capable of conveying to us an idea of extension, when unaccompanied with some other perception, it can no more give us that idea, when mixed with the impressions of tangible objects, since that mixture produces no alteration upon it.

But though motion and darkness, either alone or attended with tangible and visible objects, convey no

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idea of a vacuum or extension without matter, yet they are the causes why we falsely imagine we can form such an idea. For there is a close relation betwixt that motion and darkness, and a real extension, or composition of visible and tangible objects.

First, we may observe, that two visible objects, appearing in the midst of utter darkness, affect the senses in the same manner, and form the same angle by the rays which flow from them, and meet in the eye, as if the distance betwixt them were filled with visible objects, that give us a true idea of extension. The sensation of motion is likewise the same, when there is nothing tangible interposed betwixt two bodies, as when we feel a compounded body, whose different parts are placed beyond each other.

Secondly, we find by experience, that two bodies, which are so placed as to affect the senses in the same manner with two others, that have a certain extent of visible objects interposed betwixt them, are capable of receiving the same extent, without any sensible impulse or penetration, and without any change on that angle, under which they appear to the senses. In like manner, where there is one object, which we cannot feel after another without an interval, and the perceiving of that sensation we call motion in our hand or organ of sensation; experience shews us, that 'tis possible the same object may be felt with the same sensation of motion, along with the interposed impression of solid and tangible objects, attending the sensation. That is, in other words, an invisible and intangible distance may be converted into a visible and tangible one, without any change on the distant objects.

Thirdly, we may observe, as another relation betwixt these two kinds of distance, that they have nearly

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The same subject continued.

the same effects on every natural phenomenon. For as all qualities, such as heat, cold, light, attraction, &c. diminish in proportion to the distance; there is but little difference observed, whether this distance be marked out by compounded and sensible objects, or be known only by the manner in which the distant objects affect the senses.

Here then are three relations betwixt that distance, which conveys the idea of extension, and that other, which is not filled with any coloured or solid object. The distant objects affect the senses in the same manner, whether separated by the one distance or the other; the second species of distance is found capable of receiving the first; and they both equally diminish the force of every quality.

These relations betwixt the two kinds of distance, will afford us an easy reason why the one has so often been taken for the other, and why we imagine we have an idea of extension without the idea of any object either of the sight or feeling. For we may establish it as a general maxim in this science of human nature, that wherever there is a close relation betwixt two ideas, the mind is very apt to mistake them, and in all its discourses and reasonings to use the one for the other. This phenomenon occurs on so many occasions, and is of such consequence, that I cannot forbear stopping a moment to examine its causes. I shall only premise, that we must distinguish exactly betwixt the phenomenon itself, and the causes which I shall assign for it; and must not imagine, from any uncertainty in the latter, that the former is also uncertain. The phenomenon may be real, though my explication be chimerical. The falsehood of the one is no consequence of that of the other; though at the same time we may observe,

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that 'tis very natural for us to draw such a consequence; which is an evident instance of that very principle, which I endeavour to explain.

When I received the relations of *resemblance*, *contiguity*, and *causation*, as principles of union among ideas, without examining into their causes, 'twas more in prosecution of my first maxim, that we must in the end rest contented with experience, than for want of something specious and plausible, which I might have displayed on that subject. 'Twould have been easy to have made an imaginary dissection of the brain, and have shown, why, upon our conception of any idea, the animal spirits run into all the contiguous traces, and rouze up the other ideas that are related to it. But though I have neglected any advantage, which I might have drawn from this topic in explaining the relations of ideas, I am afraid I must here have recourse to it, in order to account for the mistakes that arise from these relations. I shall therefore observe, that as the mind is endowed with a power of exciting any idea it pleases; whenever it despatches the spirits into that region of the brain, in which the idea is placed; these spirits always excite the idea, when they run precisely into the proper traces, and rummage that cell, which belongs to the idea. But as their motion is seldom direct, and naturally turns a little to the one side or the other; for this reason the animal spirits, falling into the contiguous traces, present other related ideas, in lieu of that which the mind desired at first to survey. This change we are not always sensible of; but continuing still the same train of thought, make use of the related idea, which is presented to us, and employ it in our reasoning, as if it were the same with what we demanded. This is the cause of many mistakes and sophisms in

SECT. V.

The same subject continued.

philosophy; as will naturally be imagined, and as it would be easy to show, if there was occasion.

Of the three relations above-mentioned that of resemblance is the most fertile source of error; and indeed there are few mistakes in reasoning, which do not borrow largely from that origin. Resembling ideas are not only related together, but the actions of the mind, which we employ in considering them, are so little different, that we are not able to distinguish them. This last circumstance is of great consequence; and we may in general observe, that wherever the actions of the mind in forming any two ideas are the same or resembling, we are very apt to confound these ideas, and take the one for the other. Of this we shall see many instances in the progress of this treatise. But though resemblance be the relation, which most readily produces a mistake in ideas, yet the others of causation and contiguity may also concur in the same influence. We might produce the figures of poets and orators, as sufficient proofs of this, were it as usual as it is reasonable, in metaphysical subjects, to draw our arguments from that quarter. But lest metaphysicians should esteem this below their dignity, I shall borrow a proof from an observation, which may be made on most of their own discourses, viz. that 'tis usual for men to use words for ideas, and to talk instead of thinking in their reasonings. We use words for ideas, because they are commonly so closely connected, that the mind easily mistakes them. And this likewise is the reason, why we substitute the idea of a distance, which is not considered either as visible or tangible, in the room of extension, which is nothing but a composition of visible or tangible points disposed in a certain order. In causing this mistake there concur both the

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relations of *causation* and *resemblance*. As the first species of distance is found to be convertible into the second, 'tis in this respect a kind of cause; and the similarity of their manner of affecting the senses, and diminishing every quality, forms the relation of resemblance.

After this chain of reasoning and explication of my principles, I am now prepared to answer all the objections that have been offered, whether derived from *metaphysics* or *mechanics*. The frequent disputes concerning a vacuum, or extension without matter, prove not the reality of the idea, upon which the dispute turns; there being nothing more common, than to see men deceive themselves in this particular; especially when, by means of any close relation, there is another idea presented, which may be the occasion of their mistake.

We may make almost the same answer to the second objection, derived from the conjunction of the ideas of rest and annihilation. When every thing is annihilated in the chamber, and the walls continue immovable, the chamber must be conceived much in the same manner as at present, when the air that fills it is not an object of the senses. This annihilation leaves to the *eye* that fictitious distance, which is discovered by the different parts of the organ that are affected, and by the degrees of light and shade; and to the *feeling*, that which consists in a sensation of motion in the hand, or other member of the body. In vain should we search any farther. On whichever side we turn this subject, we shall find that these are the only impressions such an object can produce after the supposed annihilation; and it has already been remarked, that impressions can give rise to no ideas, but to such as resemble them.

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The same subject continued.

Since a body interposed betwixt two others may be supposed to be annihilated, without producing any change upon such as lie on each hand of it, 'tis easily conceived, how it may be created anew, and yet produce as little alteration. Now the motion of a body has much the same effect as its creation. The distant bodies are no more affected in the one case, than in the other. This suffices to satisfy the imagination, and proves there is no repugnance in such a motion. Afterwards experience comes in play to persuade us that two bodies, situated in the manner above described, have really such a capacity of receiving body betwixt them, and that there is no obstacle to the conversion of the invisible and intangible distance into one that is visible and tangible. However natural that conversion may seem, we cannot be sure it is practicable, before we have had experience of it.

Thus I seem to have answered the three objections above mentioned; though at the same time I am sensible, that few will be satisfied with these answers, but will immediately propose new objections and difficulties. 'Twill probably be said, that my reasoning makes nothing to the matter in hand, and that I explain only the manner in which objects affect the senses, without endeavouring to account for their real nature and operations. Though there be nothing visible or tangible interposed betwixt two bodies, yet we find *by experience*, that the bodies may be placed in the same manner, with regard to the eye, and require the same motion of the hand in passing from one to the other, as if divided by something visible and tangible. This invisible and intangible distance is also found *by experience* to contain a capacity of receiving body, or of becoming visible and tangible. Here is the whole of my

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system; and in no part of it have I endeavoured to explain the cause, which separates bodies after this manner, and gives them a capacity of receiving others betwixt them, without any impulse or penetration.

I answer this objection, by pleading guilty, and by confessing that my intention never was to penetrate into the nature of bodies, or explain the secret causes of their operations. For, besides that this belongs not to my present purpose, I am afraid, that such an enterprise is beyond the reach of human understanding, and that we can never pretend to know body otherwise than by those external properties, which discover themselves to the senses. As to those who attempt any thing farther, I cannot approve of their ambition, till I see, in some one instance at least, that they have met with success. But at present I content myself with knowing perfectly the manner in which objects affect my senses, and their connexions with each other, as far as experience informs me of them. This suffices for the conduct of life; and this also suffices for my philosophy, which pretends only to explain the nature and causes of our perceptions, or impressions and ideas. *

* As long as we confine our speculations to *the appearances* of objects to our senses, without entering into disquisitions concerning their real nature and operations, we are safe from all difficulties, and can never be embarrassed by any question. Thus, if it be asked, if the invisible and intangible distance, interposed betwixt two objects, be something or nothing: 'tis easy to answer, that it is *something*, viz. a property of the objects, which affect the *senses* after such a particular manner. If it be asked, whether two objects, having such a distance betwixt them, touch or not: it may be answered, that this depends upon the definition of the word *touch*. If objects be said to touch, when there is nothing *sensible* interposed betwixt them, these objects touch: If objects be said to touch, when their *images* strike contiguous parts of the eye, and when the hand *feels* both objects successively, without any interposed motion, these objects do

SECT. V.

The same subject continued.

I shall conclude this subject of extension with a paradox, which will easily be explained from the foregoing reasoning. This paradox is, that if you are pleased to give to the invisible and intangible distance, or in other words, to the capacity of becoming a visible and tangible distance, the name of a vacuum, extension and matter are the same, and yet there is a vacuum. If you will not give it that name, motion is possible in a plenum, without any impulse *in infinitum*, without returning in a circle, and without penetration. But however we may express ourselves, we must always confess, that we have no idea of any real extension without filling it with sensible objects, and conceiving its parts as visible or tangible.

As to the doctrine, that time is nothing but the manner in which some real objects exist; we may observe, that 'tis liable to the same objections as the similar doc-

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not touch. The appearances of objects to our senses are all consistent; and no difficulties can ever arise, but from the obscurity of the terms we make use of.

If we carry our inquiry beyond the appearances of objects to the senses, I am afraid, that most of our conclusions will be full of scepticism and uncertainty. Thus, if it be asked, whether or not the invisible and intangible distance be always full of *body*, or of something that by an improvement of our organs might become visible or tangible, I must acknowledge, that I find no very decisive arguments on either side: though I am inclined to the contrary opinion, as being more suitable to vulgar and popular notions. If *the Newtonian* philosophy be rightly understood, it will be found to mean no more. A vacuum is asserted; that is, bodies are said to be placed after such a manner, as to receive bodies betwixt them, without impulsion or penetration. The real nature of this position of bodies is unknown. We are only acquainted with its effects on the senses, and its power of receiving body. Nothing is more suitable to that philosophy, than a modest scepticism to a certain degree, and a fair confession of ignorance in subjects that exceed all human capacity.

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trine with regard to extension. If it be a sufficient proof, that we have the idea of a vacuum, because we dispute and reason concerning it; we must for the same reason have the idea of time without any changeable existence; since there is no subject of dispute more frequent and common. But that we really have no such idea, is certain. For whence should it be derived? Does it arise from an impression of sensation or of reflection? Point it out distinctly to us, that we may know its nature and qualities. But if you cannot point out *any such impression*, you may be certain you are mistaken, when you imagine you have *any such idea*.

But though it be impossible to show the impression, from which the idea of time without a changeable existence is derived, yet we can easily point out those appearances, which make us fancy we have that idea. For we may observe, that there is a continual succession of perceptions in our mind; so that the idea of time being for ever present with us, when we consider a stedfast object at five o'clock, and regard the same at six, we are apt to apply to it that idea in the same manner as if every moment were distinguished by a different position, or an alteration of the object. The first and second appearances of the object, being compared with the succession of our perceptions, seem equally removed as if the object had really changed. To which we may add, what experience shows us, that the object was susceptible of such a number of changes betwixt these appearances; as also that the unchangeable or rather fictitious duration has the same effect upon every quality, by increasing or diminishing it, as that succession which is obvious to the senses. From these three relations we are apt to confound our ideas,

and imagine we can form the idea of a time and duration, without any change or succession.

SECT. V. The same subject continued.

SECTION VI.

OF THE IDEA OF EXISTENCE, AND OF EXTERNAL EXISTENCE.

It may not be amiss, before we leave this subject, to explain the ideas of *existence* and of *external existence*; which have their difficulties, as well as the ideas of space and time. By this means we shall be the better prepared for the examination of knowledge and probability, when we understand perfectly all those particular ideas, which may enter into our reasoning.

There is no impression nor idea of any kind, of which we have any consciousness or memory, that is not conceived as existent; and 'tis evident that, from this consciousness, the most perfect idea and assurance of *being* is derived. From hence we may form a dilemma, the most clear and conclusive that can be imagined, viz. that since we never remember any idea or impression without attributing existence to it, the idea of existence must either be derived from a distinct impression, conjoined with every perception or object of our thought, or must be the very same with the idea of the perception or object.

As this dilemma is an evident consequence of the principle, that every idea arises from a similar impression, so our decision betwixt the propositions of the dilemma is no more doubtful. So far from there being any distinct impression attending every impression and

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every idea, that I do not think there are any two distinct impressions which are inseparably conjoined. Though certain sensations may at one time be united, we quickly find they admit of a separation, and may be presented apart. And thus, though every impression and idea we remember be considered as existent, the idea of existence is not derived from any particular impression.

The idea of existence, then, is the very same with the idea of what we conceive to be existent. To reflect on any thing simply, and to reflect on it as existent, are nothing different from each other. That idea, when conjoined with the idea of any object, makes no addition to it. Whatever we conceive, we conceive to be existent. Any idea we please to form is the idea of a being; and the idea of a being is any idea we please to form.

Whoever opposes this, must necessarily point out that distinct impression, from which the idea of entity is derived, and must prove, that this impression is inseparable from every perception we believe to be existent. This we may without hesitation conclude to be impossible.

Our foregoing reasoning * concerning the *distinction* of ideas without any real *difference* will not here serve us in any stead. That kind of distinction is founded on the different resemblances, which the same simple idea may have to several different ideas. But no object can be presented resembling some object with respect to its existence, and different from others in the same particular; since every object that is presented, must necessarily be existent.

* Part I. Sect. 7.

SECT. VI. Of the idea of existence, and of external existence.

A like reasoning will account for the idea of *external existence*. We may observe, that 'tis universally allowed by philosophers, and is besides pretty obvious of itself, that nothing is ever really present with the mind but its perceptions or impressions and ideas, and that external objects become known to us only by those perceptions they occasion. To hate, to love, to think, to feel, to see; all this is nothing but to perceive.

Now, since nothing is ever present to the mind but perceptions, and since all ideas are derived from something antecedently present to the mind; it follows, that 'tis impossible for us so much as to conceive or form an idea of any thing specifically different from ideas and impressions. Let us fix our attention out of ourselves as much as possible; let us chase our imagination to the heavens, or to the utmost limits of the universe; we never really advance a step beyond ourselves, nor can conceive any kind of existence, but those perceptions, which have appeared in that narrow compass. This is the universe of the imagination, nor have we any idea but what is there produced.

The farthest we can go towards a conception of external objects, when supposed *specifically* different from our perceptions, is to form a relative idea of them, without pretending to comprehend the related objects. Generally speaking, we do not suppose them specifically different; but only attribute to them different relations, connexions, and durations. But of this more fully hereafter. *

* Part IV. Sect. 2.

PART III.

OF KNOWLEDGE AND PROBABILITY.

SECTION I.

OF KNOWLEDGE.

PART III. Of knowledge and probability.

THERE are seven different kinds of philosophical relation, * viz. *resemblance, identity, relations of time and place, proportion in quantity or number, degrees in any quality, contrariety, and causation.* These relations may be divided into two classes; into such as depend entirely on the ideas, which we compare together, and such as may be changed without any change in the ideas. 'Tis from the idea of a triangle, that we discover the relation of equality, which its three angles bear to two right ones; and this relation is invariable, as long as our idea remains the same. On the contrary, the relations of *contiguity* and *distance* betwixt two objects may be changed merely by an alteration of their place, without any change on the objects themselves or on their ideas; and the place depends on a hundred different accidents, which cannot be foreseen by the

* Part I. Sect. 5.

mind. 'Tis the same case with *identity* and *causation*. Two objects, though perfectly resembling each other, and even appearing in the same place at different times, may be numerically different: and as the power, by which one object produces another, is never discoverable merely from their idea, 'tis evident *cause* and *effect* are relations, of which we receive information from experience, and not from any abstract reasoning or reflection. There is no single phenomenon, even the most simple, which can be accounted for from the qualities of the objects, as they appear to us; or which we could foresee without the help of our memory and experience.

It appears therefore that of these seven philosophical relations, there remain only four, which depending solely upon ideas, can be the objects of knowledge and certainty. These four are *resemblance*, *contrariety*, *degrees in quality*, *and proportions in quantity or number*. Three of these relations are discoverable at first sight, and fall more properly under the province of intuition than demonstration. When any objects *resemble* each other, the resemblance will at first strike the eye, or rather the mind; and seldom requires a second examination. The case is the same with *contrariety*, and with the *degrees* of any *quality*. No one can once doubt but existence and non-existence destroy each other, and are perfectly incompatible and contrary. And though it be impossible to judge exactly of the degrees of any quality, such as colour, taste, heat, cold, when the difference betwixt them is very small; yet 'tis easy to decide, that any of them is superior or inferior to another, when their difference is considerable. And this decision we always pronounce at first sight, without any inquiry or reasoning.

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We might proceed, after the same manner, in fixing the *proportions of quantity* or *number*, and might at one view observe a superiority or inferiority betwixt any numbers, or figures; especially where the difference is very great and remarkable. As to equality or any exact proportion, we can only guess at it from a single consideration; except in very short numbers, or very limited portions of extension; which are comprehended in an instant, and where we perceive an impossibility of falling into any considerable error. In all other cases we must settle the proportions with some liberty, or proceed in a more *artificial* manner.

I have already observed, that geometry, or the *art* by which we fix the proportions of figures; though it much excels both in universality and exactness, the loose judgments of the senses and imagination; yet never attains a perfect precision and exactness. Its first principles are still drawn from the general appearance of the objects; and that appearance can never afford us any security, when we examine the prodigious minuteness of which nature is susceptible. Our ideas seem to give a perfect assurance, that no two right lines can have a common segment; but if we consider these ideas, we shall find, that they always suppose a sensible inclination of the two lines, and that where the angle they form is extremely small, we have no standard of a right line so precise as to assure us of the truth of this proposition. 'Tis the same case with most of the primary decisions of the mathematics.

There remain therefore algebra and arithmetic as the only sciences, in which we can carry on a chain of reasoning to any degree of intricacy, and yet preserve a perfect exactness and certainty. We are possessed

of a precise standard, by which we can judge of the equality and proportion of numbers; and according as they correspond or not to that standard, we determine their relations, without any possibility of error. When two numbers are so combined, as that the one has always an unite answering to every unite of the other, we pronounce them equal; and 'tis for want of such a standard of equality in extension, that geometry can scarce be esteemed a perfect and infallible science.

But here it may not be amiss to obviate a difficulty, which may arise from my asserting, that though geometry falls short of that perfect precision and certainty, which are peculiar to arithmetic and algebra, yet it excels the imperfect judgments of our senses and imagination. The reason why I impute any defect to geometry, is, because its original and fundamental principles are derived merely from appearances; and it may perhaps be imagined, that this defect must always attend it, and keep it from ever reaching a greater exactness in the comparison of objects or ideas, than what our eye or imagination alone is able to attain. I own that this defect so far attends it, as to keep it from ever aspiring to a full certainty: but since these fundamental principles depend on the easiest and least deceitful appearances, they bestow on their consequences a degree of exactness, of which these consequences are singly incapable. 'Tis impossible for the eye to determine the angles of a chiliagon to be equal to 1996 right angles, or make any conjecture, that approaches this proportion; but when it determines, that right lines cannot concur; that we cannot draw more than one right line between two given points; its mistakes can never be of any consequence. And this is the nature and use of geometry, to run us up to such

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appearances, as, by reason of their simplicity, cannot lead us into any considerable error.

I shall here take occasion to propose a second observation concerning our demonstrative reasonings, which is suggested by the same subject of the mathematics. 'Tis usual with mathematicians to pretend, that those ideas, which are their objects, are of so refined and spiritual a nature, that they fall not under the conception of the fancy, but must be comprehended by a pure and intellectual view, of which the superior faculties of the soul are alone capable. The same notion runs through most parts of philosophy, and is principally made use of to explain our abstract ideas, and to show how we can form an idea of a triangle, for instance, which shall neither be an isosceles nor scalenum, nor be confined to any particular length and proportion of sides. 'Tis easy to see why philosophers are so fond of this notion of some spiritual and refined perceptions; since by that means they cover many of their absurdities, and may refuse to submit to the decisions of clear ideas, by appealing to such as are obscure and uncertain. But to destroy this artifice, we need but reflect on that principle so oft insisted on, *that all our ideas are copied from our impressions.* For from thence we may immediately conclude, that since all impressions are clear and precise, the ideas, which are copied from them, must be of the same nature, and can never, but from our fault, contain any thing so dark and intricate. An idea is by its very nature weaker and fainter than an impression; but being in every other respect the same, cannot imply any very great mystery. If its weakness render it obscure, 'tis our business to remedy that defect, as much as possible, by keeping the idea steady and precise; and till

we have done so, 'tis in vain to pretend to reasoning and philosophy.

SECTION II.

OF PROBABILITY, AND OF THE IDEA OF CAUSE AND EFFECT.

THIS is all I think necessary to observe concerning those four relations, which are the foundation of science; but as to the other three, which depend not upon the idea, and may be absent or present even while *that* remains the same, 'twill be proper to explain them more particularly. These three relations are *identity, the situations in time and place, and causation.*

All kinds of reasoning consist in nothing but a *comparison,* and a discovery of those relations, either constant or inconstant, which two or more objects bear to each other. This comparison we may make, either when both the objects are present to the senses, or when neither of them is present, or when only one. When both the objects are present to the senses along with the relation, we call *this* perception rather than reasoning; nor is there in this case any exercise of the thought, or any action, properly speaking, but a mere passive admission of the impressions through the organs of sensation. According to this way of thinking, we ought not to receive as reasoning any of the observations we may make concerning *identity,* and the *relations* of *time* and *place;* since in none of them the mind can go beyond what is immediately present to the senses, either to discover the real exist-

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ence or the relations of objects. 'Tis only *causation*, which produces such a connexion, as to give us assurance from the existence or action of one object, that 'twas followed or preceded by any other existence or action; nor can the other two relations ever be made use of in reasoning, except so far as they either affect or are affected by it. There is nothing in any objects to persuade us, that they are either always *remote* or always *contiguous*; and when from experience and observation we discover, that their relation in this particular is invariable, we always conclude there is some secret *cause* which separates or unites them. The same reasoning extends to *identity*. We readily suppose an object may continue individually the same, though several times absent from and present to the senses; and ascribe to it an identity, notwithstanding the interruption of the perception, whenever we conclude, that if we had kept our eye or hand constantly upon it, it would have conveyed an invariable and uninterrupted perception. But this conclusion beyond the impressions of our senses can be founded only on the connexion of *cause and effect*; nor can we otherwise have any security that the object is not changed upon us, however much the new object may resemble that which was formerly present to the senses. Whenever we discover such a perfect resemblance, we consider whether it be common in that species of objects; whether possibly or probably any cause could operate in producing the change and resemblance; and according as we determine concerning these causes and effects, we form our judgment concerning the identity of the object.

Here then it appears, that of those three relations, which depend not upon the mere ideas, the only one that can be traced beyond our senses, and informs us

SECT. II. Of probability, and of the idea of cause and effect.

of existences and objects, which we do not see or feel, is *causation*. This relation therefore we shall endeavour to explain fully before we leave the subject of the understanding.

To begin regularly, we must consider the idea of *causation*, and see from what origin it is derived. 'Tis impossible to reason justly, without understanding perfectly the idea concerning which we reason; and 'tis impossible perfectly to understand any idea, without tracing it up to its origin, and examining that primary impression, from which it arises. The examination of the impression bestows a clearness on the idea; and the examination of the idea bestows a like clearness on all our reasoning.

Let us therefore cast our eye on any two objects, which we call cause and effect, and turn them on all sides, in order to find that impression, which produces an idea of such prodigious consequence. At first sight I perceive, that I must not search for it in any of the particular *qualities* of the objects; since, whichever of these qualities I pitch on, I find some object that is not possessed of it, and yet falls under the denomination of cause or effect. And indeed there is nothing existent, either externally or internally, which is not to be considered either as a cause or an effect; though 'tis plain there is no one quality which universally belongs to all beings, and gives them a title to that denomination.

The idea then of causation must be derived from some *relation* among objects; and that relation we must now endeavour to discover. I find in the first place, that whatever objects are considered as causes or effects, are *contiguous*; and that nothing can operate in a time or place, which is ever so little removed

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from those of its existence. Though distant objects may sometimes seem productive of each other, they are commonly found upon examination to be linked by a chain of causes, which are contiguous among themselves, and to the distant objects; and when in any particular instance we cannot discover this connexion, we still presume it to exist. We may therefore consider the relation of *contiguity* as essential to that of causation; at least may suppose it such, according to the general opinion, till we can find a more proper occasion * to clear up this matter, by examining what objects are or are not susceptible of juxtaposition and conjunction.

The second relation I shall observe as essential to causes and effects, is not so universally acknowledged, but is liable to some controversy. 'Tis that of *priority* of time in the cause before the effect. Some pretend that 'tis not absolutely necessary a cause should precede its effect; but that any object or action, in the very first moment of its existence, may exert its productive quality, and give rise to another object or action, perfectly cotemporary with itself. But beside that experience in most instances seems to contradict this opinion, we may establish the relation of priority by a kind of inference or reasoning. 'Tis an established maxim both in natural and moral philosophy, that an object, which exists for any time in its full perfection without producing another, is not its sole cause; but is assisted by some other principle which pushes it from its state of inactivity, and makes it exert that energy, of which it was secretly possessed. Now if any cause may be perfectly cotemporary with its effect, 'tis certain, according to this maxim, that they must

* Part IV. Sect. 5.

all of them be so; since any one of them, which retards its operation for a single moment, exerts not itself at that very individual time, in which it might have operated; and therefore is no proper cause. The consequence of this would be no less than the destruction of that succession of causes, which we observe in the world; and indeed the utter annihilation of time. For if one cause were cotemporary with its effect, and this effect with *its* effect, and so on, 'tis plain there would be no such thing as succession, and all objects must be co-existent.

If this argument appear satisfactory, 'tis well. If not, I beg the reader to allow me the same liberty, which I have used in the preceding case, of supposing it such. For he shall find, that the affair is of no great importance.

Having thus discovered or supposed the two relations of *contiguity* and *succession* to be essential to causes and effects, I find I am stopped short, and can proceed no farther in considering any single instance of cause and effect. Motion in one body is regarded upon impulse as the cause of motion in another. When we consider these objects with the utmost attention, we find only that the one body approaches the other; and that the motion of it precedes that of the other, but without any sensible interval. 'Tis in vain to rack ourselves with *farther* thought and reflection upon this subject. We can go no *farther* in considering this particular instance.

Should any one leave this instance, and pretend to define a cause, by saying it is something productive of another, 'tis evident he would say nothing. For what does he mean by *production?* Can he give any definition of it, that will not be the same with that of cau-

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sation? If he can, I desire it may be produced. If he cannot, he here runs in a circle, and gives a synonymous term instead of a definition.

Shall we then rest contented with these two relations of contiguity and succession, as affording a complete idea of causation? By no means. An object may be contiguous and prior to another, without being considered as its cause. There is a *necessary connexion* to be taken into consideration; and that relation is of much greater importance, than any of the other two above mentioned.

Here again I turn the object on all sides, in order to discover the nature of this necessary connexion, and find the impression, or impressions, from which its idea may be derived. When I cast my eye on the *known qualities* of objects, I immediately discover that the relation of cause and effect depends not in the least on *them*. When I consider their *relations*, I can find none but those of contiguity and succession; which I have already regarded as imperfect and unsatisfactory. Shall the despair of success make me assert, that I am here possessed of an idea, which is not preceded by any similar impression? This would be too strong a proof of levity and inconstancy; since the contrary principle has been already so firmly established, as to admit of no farther doubt; at least, till we have more fully examined the present difficulty.

We must therefore proceed like those who, being in search of any thing that lies concealed from them, and not finding it in the place they expected, beat about all the neighbouring fields, without any certain view or design, in hopes their good fortune will at last guide them to what they search for. 'Tis necessary for us to leave the direct survey of this question con-

cerning the nature of that *necessary connexion*, which enters into our idea of cause and effect; and endeavour to find some other questions, the examination of which will perhaps afford a hint, that may serve to clear up the present difficulty. Of these questions there occur two, which I shall proceed to examine, viz.

First, for what reason we pronounce it *necessary*, that every thing whose existence has a beginning, should also have a cause?

Secondly, why we conclude, that such particular causes must *necessarily* have such particular effects; and what is the nature of that *inference* we draw from the one to the other, and of the *belief* we repose in it?

I shall only observe before I proceed any farther, that though the ideas of cause and effect be derived from the impressions of reflection as well as from those of sensation, yet for brevity's sake, I commonly mention only the latter as the origin of these ideas; though I desire that, whatever I say of them, may also extend to the former. Passions are connected with their objects and with one another; no less than external bodies are connected together. The same relation then of cause and effect, which belongs to one, must be common to all of them.

SECTION III.

WHY A CAUSE IS ALWAYS NECESSARY.

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To begin with the first question concerning the necessity of a cause: 'Tis a general maxim in philosophy, that *whatever begins to exist, must have a cause of existence.* This is commonly taken for granted in all reasonings, without any proof given or demanded. 'Tis supposed to be founded on intuition, and to be one of those maxims which, though they may be denied with the lips, 'tis impossible for men in their hearts really to doubt of. But if we examine this maxim by the idea of knowledge above explained, we shall discover in it no mark of any such intuitive certainty; but on the contrary shall find, that 'tis of a nature quite foreign to that species of conviction.

All certainty arises from the comparison of ideas, and from the discovery of such relations as are unalterable, so long as the ideas continue the same. These relations are *resemblance, proportions in quantity and number, degrees of any quality, and contrariety;* none of which are implied in this proposition, *Whatever has a beginning has also a cause of existence.* That proposition therefore is not intuitively certain. At least any one, who would assert it to be intuitively certain, must deny these to be the only infallible relations, and must find some other relation of that kind to be implied in it; which it will then be time enough to examine.

But here is an argument, which proves at once, that

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the foregoing proposition is neither intuitively nor demonstrably certain. We can never demonstrate the necessity of a cause to every new existence, or new modification of existence, without showing at the same time the impossibility there is, that any thing can ever begin to exist without some productive principle; and where the latter proposition cannot be proved, we must despair of ever being able to prove the former. Now that the latter proposition is utterly incapable of a demonstrative proof, we may satisfy ourselves by considering, that as all distinct ideas are separable from each other, and as the ideas of cause and effect are evidently distinct, 'twill be easy for us to conceive any object to be non-existent this moment, and existent the next, without conjoining to it the distinct idea of a cause or productive principle. The separation therefore of the idea of a cause from that of a beginning of existence, is plainly possible for the imagination; and consequently the actual separation of these objects is so far possible, that it implies no contradiction nor absurdity; and is therefore incapable of being refuted by any reasoning from mere ideas, without which 'tis impossible to demonstrate the necessity of a cause.

Accordingly, we shall find upon examination, that every demonstration, which has been produced for the necessity of a cause, is fallacious and sophistical. All the points of time and place, say some philosophers, * in which we can suppose any object to begin to exist, are in themselves equal; and unless there be some cause, which is peculiar to one time and to one place, and which by that means determines and fixes the existence, it must remain in eternal suspense; and the

* Mr Hobbes.

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object can never begin to be, for want of something to fix its beginning. But I ask, is there any more difficulty in supposing the time and place to be fixed without a cause, than to suppose the existence to be determined in that manner! The first question that occurs on this subject is always, *whether* the object shall exist or not: the next, *when* and *where* it shall begin to exist. If the removal of a cause be intuitively absurd in the one case, it must be so in the other: and if that absurdity be not clear without a proof in the one case, it will equally require one in the other. The absurdity then of the one supposition can never be a proof of that of the other; since they are both upon the same footing, and must stand or fall by the same reasoning.

The second argument,* which I find used on this head, labours under an equal difficulty. Every thing, 'tis said, must have a cause; for if any thing wanted a cause, *it* would produce *itself*, that is, exist before it existed, which is impossible. But this reasoning is plainly unconclusive; because it supposes that, in our denial of a cause, we still grant what we expressly deny, viz. that there must be a cause; which therefore is taken to be the object itself; and *that*, no doubt, is an evident contradiction. But to say that any thing is produced, or, to express myself more properly, comes into existence, without a cause, is not to affirm that 'tis itself its own cause; but, on the contrary, in excluding all external causes, excludes *a fortiori* the thing itself which is created. An object that exists absolutely without any cause, certainly is not its own cause; and when you assert, that the one follows from the

* Dr Clarke and others.

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other, you suppose the very point in question, and take it for granted, that 'tis utterly impossible any thing can ever begin to exist without a cause, but that, upon the exclusion of one productive principle, we must still have recourse to another.

'Tis exactly the same case with the third argument, * which has been employed to demonstrate the necessity of a cause. Whatever is produced without any cause, is produced by *nothing*; or, in other words, has nothing for its cause. But nothing can never be a cause, no more than it can be something, or equal to two right angles. By the same intuition, that we perceive nothing not to be equal to two right angles, or not to be something, we perceive, that it can never be a cause; and consequently must perceive, that every object has a real cause of its existence.

I believe it will not be necessary to employ many words in showing the weakness of this argument, after what I have said of the foregoing. They are all of them founded on the same fallacy, and are derived from the same turn of thought. 'Tis sufficient only to observe, that when we exclude all causes we really do exclude them, and neither suppose nothing nor the object itself to be the causes of the existence; and consequently can draw no argument from the absurdity of these suppositions to prove the absurdity of that exclusion. If every thing must have a cause, it follows, that, upon the exclusion of other causes, we must accept of the object itself or of nothing as causes. But 'tis the very point in question, whether every thing must have a cause or not; and therefore, according to all just reasoning, it ought never to be taken for granted.

* Mr Locke.

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They are still more frivolous who say, that every effect must have a cause, because 'tis implied in the very idea of effect. Every effect necessarily presupposes a cause; effect being a relative term, of which cause is the correlative. But this does not prove that every being must be preceded by a cause; no more than it follows, because every husband must have a wife, that therefore every man must be married. The true state of the question is, whether every object which begins to exist, must owe its existence to a cause; and this I assert neither to be intuitively nor demonstratively certain, and hope to have proved it sufficiently by the foregoing arguments.

Since it is not from knowledge or any scientific reasoning, that we derive the opinion of the necessity of a cause to every new production, that opinion must necessarily arise from observation and experience. The next question, then, should naturally be, *how experience gives rise to such a principle?* But as I find it will be more convenient to sink this question in the following, *why we conclude, that such particular causes must necessarily have such particular effects, and why we form an inference from one to another?* we shall make that the subject of our future inquiry. 'Twill, perhaps, be found in the end, that the same answer will serve for both questions.

SECTION IV.

OF THE COMPONENT PARTS OF OUR REASONINGS CONCERNING CAUSE AND EFFECT.

SECT. IV. Of the component parts of our reasonings concerning cause and effect.

THOUGH the mind in its reasonings from causes or effects, carries its view beyond those objects which it sees or remembers, it must never lose sight of them entirely, nor reason merely upon its own ideas, without some mixture of impressions, or at least of ideas of the memory, which are equivalent to impressions. When we infer effects from causes, we must establish the existence of these causes; which we have only two ways of doing, either by an immediate perception of our memory or senses, or by an inference from other causes; which causes again we must ascertain in the same manner, either by a present impression or by an inference from *their* causes, and so on, till we arrive at some object, which we see or remember. 'Tis impossible for us to carry on our inferences *in infinitum*; and the only thing that can stop them, is an impression of the memory or senses, beyond which there is no room for doubt or inquiry.

To give an instance of this, we may choose any point of history, and consider for what reason we either believe or reject it. Thus, we believe that Cæsar was killed in the senate-house on the *ides* of *March*, and that because this fact is established on the unanimous testimony of historians, who agree to assign this precise time and place to that event. Here are certain

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characters and letters present either to our memory or senses; which characters we likewise remember to have been used as the signs of certain ideas; and these ideas were either in the minds of such as were immediately present at that action, and received the ideas directly from its existence; or they were derived from the testimony of others, and that again from another testimony, by a visible gradation, till we arrive at those who were eye-witnesses and spectators of the event. 'Tis obvious all this chain of argument or connexion of causes and effects, is at first founded on those characters or letters, which are seen or remembered, and that without the authority either of the memory or senses, our whole reasoning would be chimerical and without foundation. Every link of the chain would in that case hang upon another; but there would not be any thing fixed to one end of it, capable of sustaining the whole; and consequently there would be no belief nor evidence. And this actually is the case with all *hypothetical* arguments, or reasonings upon a supposition; there being in them neither any present impression, nor belief of a real existence.

I need not observe, that 'tis no just objection to the present doctrine, that we can reason upon our past conclusions or principles, without having recourse to those impressions, from which they first arose. For even supposing these impressions should be entirely effaced from the memory, the conviction they produced may still remain; and 'tis equally true, that all reasonings concerning causes and effects are originally derived from some impression; in the same manner, as the assurance of a demonstration proceeds always from a comparison of ideas, though it may continue after the comparison is forgot.

SECTION V.

OF THE IMPRESSIONS OF THE SENSES AND MEMORY.

SECT. V. Of the impressions of the senses and memory.

In this kind of reasoning, then, from causation, we employ materials, which are of a mixed and heterogeneous nature, and which, however connected, are yet essentially different from each other. All our arguments concerning causes and effects consist both of an impression of the memory or senses, and of the idea of that existence, which produces the object of the impression, or is produced by it. Here, therefore, we have three things to explain, viz. *first*, the original impression. *Secondly*, the transition to the idea of the connected cause or effect. *Thirdly*, the nature and qualities of that idea.

As to those *impressions*, which arise from the *senses*, their ultimate cause is, in my opinion, perfectly inexplicable by human reason, and 'twill always be impossible to decide with certainty, whether they arise immediately from the object, or are produced by the creative power of the mind, or are derived from the Author of our being. Nor is such a question any way material to our present purpose. We may draw inferences from the coherence of our perceptions, whether they be true or false; whether they represent nature justly, or be mere illusions of the senses.

When we search for the characteristic, which distinguishes the *memory* from the imagination, we must immediately perceive, that it cannot lie in the simple ideas it presents to us; since both these faculties bor-

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row their simple ideas from the impressions, and can never go beyond these original perceptions. These faculties are as little distinguished from each other by the arrangement of their complex ideas. For, though it be a peculiar property of the memory to preserve the original order and position of its ideas, while the imagination transposes and changes them as it pleases; yet this difference is not sufficient to distinguish them in their operation, or make us know the one from the other; it being impossible to recal the past impressions, in order to compare them with our present ideas, and see whether their arrangement be exactly similar. Since therefore the memory is known, neither by the order of its *complex* ideas, nor the nature of its *simple* ones; it follows, that the difference betwixt it and the imagination lies in its superior force and vivacity. A man may indulge his fancy in feigning any past scene of adventures; nor would there be any possibility of distinguishing this from a remembrance of a like kind, were not the ideas of the imagination fainter and more obscure.

It frequently happens, that when two men have been engaged in any scene of action, the one shall remember it much better than the other, and shall have all the difficulty in the world to make his companion recollect it. He runs over several circumstances in vain; mentions the time, the place, the company, what was said, what was done on all sides; till at last he hits on some lucky circumstance, that revives the whole, and gives his friend a perfect memory of every thing. Here the person that forgets, receives at first all the ideas from the discourse of the other, with the same circumstances of time and place; though he considers them as mere fictions of the imagination. But as soon

as the circumstance is mentioned that touches the memory, the very same ideas now appear in a new light, and have, in a manner, a different feeling from what they had before. Without any other alteration, beside that of the feeling, they become immediately ideas of the memory, and are assented to.

Since therefore the imagination can represent all the same objects that the memory can offer to us, and since those faculties are only distinguished by the different *feeling* of the ideas they present, it may be proper to consider what is the nature of that feeling. And here I believe every one will readily agree with me, that the ideas of the memory are more *strong* and *lively* than those of the fancy.

A painter, who intended to represent a passion or emotion of any kind, would endeavour to get a sight of a person actuated by a like emotion, in order to enliven his ideas, and give them a force and vivacity superior to what is found in those, which are mere fictions of the imagination. The more recent this memory is, the clearer is the idea; and when, after a long interval, he would return to the contemplation of his object, he always finds its idea to be much decayed, if not wholly obliterated. We are frequently in doubt concerning the ideas of the memory, as they become very weak and feeble; and are at a loss to determine whether any image proceeds from the fancy or the memory, when it is not drawn in such lively colours as distinguish that latter faculty. I think I remember such an event, says one; but am not sure. A long tract of time has almost worn it out of my memory, and leaves me uncertain whether or not it be the pure offspring of my fancy.

And as an idea of the memory, by losing its force

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and vivacity, may degenerate to such a degree, as to be taken for an idea of the imagination; so, on the other hand, an idea of the imagination may acquire such a force and vivacity, as to pass for an idea of the memory, and counterfeit its effects on the belief and judgment. This is noted in the case of liars; who by the frequent repetition of their lies, come at last to believe and remember them, as realities; custom and habit having, in this case, as in many others, the same influence on the mind as nature, and infixing the idea with equal force and vigour.

Thus it appears, that the *belief* or *assent*, which always attends the memory and senses, is nothing but the vivacity of those perceptions they present; and that this alone distinguishes them from the imagination. To believe is in this case to feel an immediate impression of the senses, or a repetition of that impression in the memory. 'Tis merely the force and liveliness of the perception, which constitutes the first act of the judgment, and lays the foundation of that reasoning, which we build upon it, when we trace the relation of cause and effect.

SECTION VI.

OF THE INFERENCE FROM THE IMPRESSION TO THE IDEA.

'Tis easy to observe, that in tracing this relation, the inference we draw from cause to effect, is not derived merely from a survey of these particular objects, and from such a penetration into their essences as may discover the dependence of the one upon the other. There

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is no object which implies the existence of any other, if we consider these objects in themselves, and never look beyond the ideas which we form of them. Such an inference would amount to knowledge, and would imply the absolute contradiction and impossibility of conceiving any thing different. But as all distinct ideas are separable, 'tis evident there can be no impossibility of that kind. When we pass from a present impression to the idea of any object, we might possibly have separated the idea from the impression, and have substituted any other idea in its room.

'Tis therefore by *experience* only that we can infer the existence of one object from that of another. The nature of experience is this. We remember to have had frequent instances of the existence of one species of objects; and also remember, that the individuals of another species of objects have always attended them, and have existed in a regular order of contiguity and succession with regard to them. Thus we remember to have seen that species of object we call *flame*, and to have felt that species of sensation we call *heat*. We likewise call to mind their constant conjunction in all past instances. Without any farther ceremony, we call the one *cause*, and the other *effect*, and infer the existence of the one from that of the other. In all those instances from which we learn the conjunction of particular causes and effects, both the causes and effects have been perceived by the senses, and are remembered: but in all cases, wherein we reason concerning them, there is only one perceived or remembered, and the other is supplied in conformity to our past experience.

Thus, in advancing, we have insensibly discovered a new relation betwixt cause and effect when we least

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expected it, and were entirely employed upon another subject. This relation is their *constant conjunction.* Contiguity and succession are not sufficient to make us pronounce any two objects to be cause and effect, unless we perceive that these two relations are preserved in several instances. We may now see the advantage of quitting the direct survey of this relation, in order to discover the nature of that *necessary connexion* which makes so essential a part of it. There are hopes, that by this means we may at last arrive at our proposed end; though, to tell the truth, this new-discovered relation of a constant conjunction seems to advance us but very little in our way. For it implies no more than this, that like objects have always been placed in like relations of contiguity and succession; and it seems evident, at least at first sight, that by this means we can never discover any new idea, and can only multiply, but not enlarge, the objects of our mind. It may be thought, that what we learn not from one object, we can never learn from a hundred, which are all of the same kind, and are perfectly resembling in every circumstance. As our senses show us in one instance two bodies, or motions, or qualities in certain relations of succession and contiguity, so our memory presents us only with a multitude of instances wherein we always find like bodies, motions, or qualities, in like relations. From the mere repetition of any past impression, even to infinity, there never will arise any new original idea, such as that of a necessary connexion; and the number of impressions has in this case no more effect than if we confined ourselves to one only. But though this reasoning seems just and obvious, yet, as it would be folly to despair too soon, we shall continue the thread of our dis-

course; and having found, that after the discovery of the constant conjunction of any objects, we always draw an inference from one object to another, we shall now examine the nature of that inference, and of the transition from the impression to the idea. Perhaps 'twill appear in the end, that the necessary connexion depends on the inference, instead of the inference's depending on the necessary connexion.

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Since it appears, that the transition from an impression present to the memory or senses to the idea of an object, which we call cause or effect, is founded on past *experience*, and on our remembrance of their *constant conjunction*, the next question is, whether experience produces the idea by means of the understanding or imagination; whether we are determined by reason to make the transition, or by a certain association and relation of perceptions. If reason determined us, it would proceed upon that principle, *that instances, of which we have had no experience, must resemble those of which we have had experience, and that the course of nature continues always uniformly the same.* In order, therefore, to clear up this matter, let us consider all the arguments upon which such a proposition may be supposed to be founded; and as these must be derived either from *knowledge* or *probability*, let us cast our eye on each of these degrees of evidence, and see whether they afford any just conclusion of this nature.

Our foregoing method of reasoning will easily convince us, that there can be no *demonstrative* arguments to prove, *that those instances of which we have had no experience resemble those of which we have had experience.* We can at least conceive a change in the course of nature; which sufficiently proves that such a

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change is not absolutely impossible. To form a clear idea of any thing is an undeniable argument for its possibility, and is alone a refutation of any pretended demonstration against it.

Probability, as it discovers not the relations of ideas, considered as such, but only those of objects, must in some respects be founded on the impressions of our memory and senses, and in some respects on our ideas. Were there no mixture of any impression in our probable reasonings, the conclusion would be entirely chimerical: and were there no mixture of ideas, the action of the mind, in observing the relation, would, properly speaking, be sensation, not reasoning. 'Tis therefore necessary, that in all probable reasonings there be something present to the mind, either seen or remembered; and that from this we infer something connected with it, which is not seen nor remembered.

The only connexion or relation of objects, which can lead us beyond the immediate impressions of our memory and senses, is that of cause and effect; and that because 'tis the only one, on which we can found a just inference from one object to another. The idea of cause and effect is derived from *experience*, which informs us, that such particular objects, in all past instances, have been constantly conjoined with each other: and as an object similar to one of these is supposed to be immediately present in its impression, we thence presume on the existence of one similar to its usual attendant. According to this account of things, which is, I think, in every point unquestionable, probability is founded on the presumption of a resemblance betwixt those objects of which we have had experience, and those of which we have had none; and

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therefore 'tis impossible this presumption can arise from probability. The same principle cannot be both the cause and effect of another; and this is, perhaps, the only proposition concerning that relation, which is either intuitively or demonstratively certain.

Should any one think to elude this argument; and without determining whether our reasoning on this subject be derived from demonstration or probability, pretend that all conclusions from causes and effects are built on solid reasoning: I can only desire that this reasoning may be produced, in order to be exposed to our examination. It may perhaps be said, that after experience of the constant conjunction of certain objects, we reason in the following manner. Such an object is always found to produce another. 'Tis impossible it could have this effect, if it was not endowed with a power of production. The power necessarily implies the effect; and therefore there is a just foundation for drawing a conclusion from the existence of one object to that of its usual attendant. The past production implies a power: the power implies a new production: and the new production is what we infer from the power and the past production.

'Twere easy for me to show the weakness of this reasoning, were I willing to make use of those observations I have already made, that the idea of *production* is the same with that of *causation*, and that no existence certainly and demonstratively implies a power in any other object; or were it proper to anticipate what I shall have occasion to remark afterwards concerning the idea we form of *power* and *efficacy*. But as such a method of proceeding may seem either to weaken my system, by resting one part of it on another, or to breed a confusion in my reasoning, I shall

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endeavour to maintain my present assertion without any such assistance.

It shall therefore be allowed for a moment, that the production of one object by another in any one instance implies a power; and that this power is connected with its effect. But it having been already proved, that the power lies not in the sensible qualities of the cause; and there being nothing but the sensible qualities present to us; I ask, why in other instances you presume that the same power still exists, merely upon the appearance of these qualities? Your appeal to past experience decides nothing in the present case; and at the utmost can only prove, that that very object, which produced any other, was at that very instant endowed with such a power; but can never prove, that the same power must continue in the same object or collection of sensible qualities; much less, that a like power is always conjoined with like sensible qualities. Should it be said, that we have experience, that the same power continues united with the same object, and that like objects are endowed with like powers, I would renew my question, *why from this experience we form any conclusion beyond those past instances, of which we have had experience?* If you answer this question in the same manner as the preceding, your answer gives still occasion to a new question of the same kind, even *in infinitum*; which clearly proves, that the foregoing reasoning had no just foundation.

Thus, not only our reason fails us in the discovery of the *ultimate connexion* of causes and effects, but even after experience has informed us of their *constant conjunction*, 'tis impossible for us to satisfy ourselves by our reason, why we should extend that experience beyond those particular instances which have fallen

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under our observation. We suppose, but are never able to prove, that there must be a resemblance betwixt those objects, of which we have had experience, and those which lie beyond the reach of our discovery.

We have already taken notice of certain relations, which make us pass from one object to another, even though there be no reason to determine us to that transition; and this we may establish for a general rule, that wherever the mind constantly and uniformly makes a transition without any reason, it is influenced by these relations. Now, this is exactly the present case. Reason can never show us the connexion of one object with another, though aided by experience, and the observation of their constant conjunction in all past instances. When the mind therefore passes from the idea or impression of one object to the idea or belief of another, it is not determined by reason, but by certain principles, which associate together the ideas of these objects, and unite them in the imagination. Had ideas no more union in the fancy, than objects seem to have to the understanding, we could never draw any inference from causes to effects, nor repose belief in any matter of fact. The inference therefore depends solely on the union of ideas.

The principles of union among ideas, I have reduced to three general ones, and have asserted, that the idea or impression of any object naturally introduces the idea of any other object, that is resembling, contiguous to, or connected with it. These principles I allow to be neither the *infallible* nor the *sole* causes of an union among ideas. They are not the infallible causes. For one may fix his attention during some time on any one object without looking farther. They are not the sole causes. For the thought has evident-

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ly a very irregular motion in running along its objects, and may leap from the heavens to the earth, from one end of the creation to the other, without any certain method or order. But though I allow this weakness in these three relations, and this irregularity in the imagination; yet I assert, that the only *general* principles which associate ideas, are resemblance, contiguity, and causation.

There is indeed a principle of union among ideas, which at first sight may be esteemed different from any of these, but will be found at the bottom to depend on the same origin. When every individual of any species of objects is found by experience to be constantly united with an individual of another species, the appearance of any new individual of either species naturally conveys the thought to its usual attendant. Thus, because such a particular idea is commonly annexed to such a particular word, nothing is required but the hearing of that word to produce the correspondent idea; and 'twill scarce be possible for the mind, by its utmost efforts, to prevent that transition. In this case it is not absolutely necessary, that upon hearing such a particular sound, we should reflect on any past experience, and consider what idea has been usually connected with the sound. The imagination of itself supplies the place of this reflection, and is so accustomed to pass from the word to the idea, that it interposes not a moment's delay betwixt the hearing of the one, and the conception of the other.

But though I acknowledge this to be a true principle of association among ideas, I assert it to be the very same with that betwixt the ideas of cause and effect, and to be an essential part in all our reasonings

from that relation. We have no other notion of cause and effect, but that of certain objects, which have been *always conjoined* together, and which in all past instances have been found inseparable. We cannot penetrate into the reason of the conjunction. We only observe the thing itself, and always find that, from the constant conjunction, the objects acquire an union in the imagination. When the impression of one becomes present to us, we immediately form an idea of its usual attendant; and consequently we may establish this as one part of the definition of an opinion or belief, that 'tis *an idea related to or associated with a present impression.*

Thus, though causation be a *philosophical* relation, as implying contiguity, succession, and constant conjunction, yet 'tis only so far as it is a *natural* relation, and produces an union among our ideas, that we are able to reason upon it, or draw any inference from it.

SECTION VII.

OF THE NATURE OF THE IDEA OR BELIEF.

THE idea of an object is an essential part of the belief of it, but not the whole. We conceive many things which we do not believe. In order then to discover more fully the nature of belief, or the qualities of those ideas we assent to, let us weigh the following considerations.

'Tis evident, that all reasonings from causes or effects terminate in conclusions concerning matter of

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fact; that is, concerning the existence of objects or of their qualities. 'Tis also evident, that the idea of existence is nothing different from the idea of any object, and that when after the simple conception of any thing we would conceive it as existent, we in reality make no addition to or alteration on our first idea. Thus, when we affirm that God is existent, we simply form the idea of such a Being as he is represented to us: nor is the existence, which we attribute to him, conceived by a particular idea, which we join to the idea of his other qualities, and can again separate and distinguish from them. But I go farther; and, not content with asserting, that the conception of the existence of any object is no addition to the simple conception of it, I likewise maintain, that the belief of the existence joins no new ideas to those, which compose the idea of the object. When I think of God, when I think of him as existent, and when I believe him to be existent, my idea of him neither increases nor diminishes. But as 'tis certain there is a great difference betwixt the simple conception of the existence of an object, and the belief of it, and as this difference lies not in the parts or composition of the idea which we conceive; it follows, that it must lie in the *manner* in which we conceive it.

Suppose a person present with me, who advances propositions, to which I do not assent, *that Cæsar died in his bed, that silver is more fusible than lead, or mercury heavier than gold*; 'tis evident that, notwithstanding my incredulity, I clearly understand his meaning, and form all the same ideas which he forms. My imagination is endowed with the same powers as his; nor is it possible for him to conceive any idea, which I cannot conceive; or conjoin any, which I cannot

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conjoin. I therefore ask, wherein consists the difference betwixt believing and disbelieving any proposition? The answer is easy with regard to propositions, that are proved by intuition or demonstration. In that case, the person who assents not only conceives the ideas according to the proposition, but is necessarily determined to conceive them in that particular manner, either immediately, or by the interposition of other ideas. Whatever is absurd is unintelligible; nor is it possible for the imagination to conceive any thing contrary to a demonstration. But as, in reasonings from causation, and concerning matters of fact, this absolute necessity cannot take place, and the imagination is free to conceive both sides of the question, I still ask, *wherein consists the difference betwixt incredulity and belief?* since in both cases the conception of the idea is equally possible and requisite.

'Twill not be a satisfactory answer to say, that a person, who does not assent to a proposition you advance; after having conceived the object in the same manner with you, immediately conceives it in a different manner, and has different ideas of it. This answer is unsatisfactory; not because it contains any falsehood, but because it discovers not all the truth. 'Tis confessed that, in all cases wherein we dissent from any person, we conceive both sides of the question; but as we can believe only one, it evidently follows, that the belief must make some difference betwixt that conception to which we assent, and that from which we dissent. We may mingle, and unite, and separate, and confound, and vary our ideas in a hundred different ways; but 'till there appears some principle, which fixes one of these different situations, we have in reality no opinion: and this principle, as

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it plainly makes no addition to our precedent ideas, can only change the *manner* of our conceiving them.

All the perceptions of the mind are of two kinds, viz. impressions and ideas, which differ from each other only in their different degrees of force and vivacity. Our ideas are copied from our impressions, and represent them in all their parts. When you would any way vary the idea of a particular object, you can only increase or diminish its force and vivacity. If you make any other change on it, it represents a different object or impression. The case is the same as in colours. A particular shade of any colour may acquire a new degree of liveliness or brightness without any other variation. But when you produce any other variation, 'tis no longer the same shade or colour; so that as belief does nothing but vary the manner in which we conceive any object, it can only bestow on our ideas an additional force and vivacity. An opinion therefore or belief may be most accurately defined, *a lively idea related to or associated with a present impression.* *

* We may here take occasion to observe a very remarkable error, which, being frequently inculcated in the schools, has become a kind of established maxim, and is universally received by all logicians. This error consists in the vulgar division of the acts of the understanding into *conception*, *judgment* and *reasoning*, and in the definitions we give of them. Conception is defined to be the simple survey of one or more ideas: judgment to be the separating or uniting of different ideas: reasoning to be the separating or uniting of different ideas by the interposition of others, which show the relation they bear to each other. But these distinctions and definitions are faulty in very considerable articles. For, *first*, 'tis far from being true, that, in every judgment which we form, we unite two different ideas; since in that proposition, *God is*, or indeed any other, which regards existence, the idea of existence is no distinct idea, which we unite with that of the object, and which is capable of forming a compound idea by the union. *Secondly*, as we can

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Here are the heads of those arguments, which lead us to this conclusion. When we infer the existence of an object from that of others, some object must always be present either to the memory or senses, in order to be the foundation of our reasoning; since the mind cannot run up with its inferences *in infinitum*. Reason can never satisfy us that the existence of any one object does ever imply that of another; so that when we pass from the impression of one to the idea or belief of another, we are not determined by reason, but by custom, or a principle of association. But belief is somewhat more than a simple idea. 'Tis a particular manner of forming an idea: and as the same idea can only be varied by a variation of its degrees of force and vivacity; it follows upon the whole, that belief is a lively idea produced by a relation to a present impression, according to the foregoing definition.

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thus form a proposition, which contains only one idea, so we may exert our reason without employing more than two ideas, and without having recourse to a third to serve as a medium betwixt them. We infer a cause immediately from its effect; and this inference is not only a true species of reasoning, but the strongest of all others, and more convincing than when we interpose another idea to connect the two extremes. What we may in general affirm concerning these three acts of the understanding is, that taking them in a proper light, they all resolve themselves into the first, and are nothing but particular ways of conceiving our objects. Whether we consider a single object, or several; whether we dwell on these objects, or run from them to others; and in whatever form or order we survey them, the act of the mind exceeds not a simple conception; and the only remarkable difference, which occurs on this occasion, is, when we join belief to the conception, and are persuaded of the truth of what we conceive. This act of the mind has never yet been explained by any philosopher; and therefore I am at liberty to propose my hypothesis concerning it; which is, that 'tis only a strong and steady conception of any idea, and such as approaches in some measure to an immediate impression.

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This operation of the mind, which forms the belief of any matter of fact, seems hitherto to have been one of the greatest mysteries of philosophy; though no one has so much as suspected, that there was any difficulty in explaining it. For my part, I must own, that I find a considerable difficulty in the case; and that even when I think I understand the subject perfectly, I am at a loss for terms to express my meaning. I conclude, by an induction which seems to me very evident, that an opinion or belief is nothing but an idea, that is different from a fiction, not in the nature, or the order of its parts, but in the *manner* of its being conceived. But when I would explain this *manner*, I scarce find any word that fully answers the case, but am obliged to have recourse to every one's feeling, in order to give him a perfect notion of this operation of the mind. An idea assented to *feels* different from a fictitious idea, that the fancy alone presents to us: and this different feeling I endeavour to explain by calling it a superior *force*, or *vivacity*, or *solidity*, or *firmness*, or *steadiness*. This variety of terms, which may seem so unphilosophical, is intended only to express that act of the mind, which renders realities more present to us than fictions, causes them to weigh more in the thought, and gives them a superior influence on the passions and imagination. Provided we agree about the thing, 'tis needless to dispute about the terms. The imagination has the command over all its ideas, and can join, and mix, and vary them in all the ways possible. It may conceive objects with all the circumstances of place and time. It may set them, in a manner, before our eyes in their true colours, just as they might have existed. But as it is impossible that that faculty can ever of itself reach belief, 'tis evident, that

belief consists not in the nature and order of our ideas, but in the manner of their conception, and in their feeling to the mind. I confess, that 'tis impossible to explain perfectly this feeling or manner of conception. We may make use of words that express something near it. But its true and proper name is *belief*, which is a term that every one sufficiently understands in common life. And in philosophy, we can go no farther than assert, that it is something *felt* by the mind, which distinguishes the ideas of the judgment from the fictions of the imagination. It gives them more force and influence; makes them appear of greater importance; infixes them in the mind; and renders them the governing principles of all our actions.

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This definition will also be found to be entirely conformable to every one's feeling and experience. Nothing is more evident, than that those ideas, to which we assent, are more strong, firm, and vivid, than the loose reveries of a castle-builder. If one person sits down to read a book as a romance, and another as a true history, they plainly receive the same ideas, and in the same order; nor does the incredulity of the one, and the belief of the other, hinder them from putting the very same sense upon their author. His words produce the same ideas in both; though his testimony has not the same influence on them. The latter has a more lively conception of all the incidents. He enters deeper into the concerns of the persons: represents to himself their actions, and characters, and friendships, and enmities: he even goes so far as to form a notion of their features, and air, and person. While the former, who gives no credit to the testimony of the author, has a more faint and languid conception of all these particulars, and, except on account of the style

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and ingenuity of the composition, can receive little entertainment from it.

SECTION VIII.

OF THE CAUSES OF BELIEF.

HAVING thus explained the nature of belief, and shown that it consists in a lively idea related to a present impression; let us now proceed to examine from what principles it is derived, and what bestows the vivacity on the idea.

I would willingly establish it as a general maxim in the science of human nature, *that when any impression becomes present to us, it not only transports the mind to such ideas as are related to it, but likewise communicates to them a share of its force and vivacity.* All the operations of the mind depend, in a great measure, on its disposition when it performs them; and according as the spirits are more or less elevated, and the attention more or less fixed, the action will always have more or less vigour and vivacity. When, therefore, any object is presented which elevates and enlivens the thought, every action, to which the mind applies itself, will be more strong and vivid, as long as that disposition continues. Now, 'tis evident the continuance of the disposition depends entirely on the objects about which the mind is employed; and that any new object naturally gives a new direction to the spirits, and changes the disposition; as on the contrary, when the mind fixes constantly on the same object, or passes easily

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and insensibly along related objects, the disposition has a much longer duration. Hence it happens, that when the mind is once enlivened by a present impression, it proceeds to form a more lively idea of the related objects, by a natural transition of the disposition from the one to the other. The change of the objects is so easy, that the mind is scarce sensible of it, but applies itself to the conception of the related idea with all the force and vivacity it acquired from the present impression.

If, in considering the nature of relation, and that facility of transition which is essential to it, we can satisfy ourselves concerning the reality of this phenomenon, 'tis well: but I must confess I place my chief confidence in experience to prove so material a principle. We may therefore observe, as the first experiment to our present purpose, that upon the appearance of the picture of an absent friend, our idea of him is evidently enlivened by the *resemblance*, and that every passion, which that idea occasions, whether of joy or sorrow, acquires new force and vigour. In producing this effect there concur both a relation and a present impression. Where the picture bears him no resemblance, or at least was not intended for him, it never so much as conveys our thought to him: and where it is absent as well as the person; though the mind may pass from the thought of the one to that of the other; it feels its idea to be rather weakened than enlivened by that transition. We take a pleasure in viewing the picture of a friend, when 'tis set before us; but when 'tis removed, rather choose to consider him directly, than by reflection in an image, which is equally distant and obscure.

The ceremonies of the Roman Catholic religion may

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be considered as experiments of the same nature. The devotees of that strange superstition usually plead in excuse of the mummeries with which they are upbraided, that they feel the good effect of those external motions, and postures, and actions, in enlivening their devotion, and quickening their fervour, which otherwise would decay away, if directed entirely to distant and immaterial objects. We shadow out the objects of our faith, say they, in sensible types and images, and render them more present to us by the immediate presence of these types, than 'tis possible for us to do, merely by an intellectual view and contemplation. Sensible objects have always a greater influence on the fancy than any other; and this influence they readily convey to those ideas to which they are related, and which they resemble. I shall only infer from these practices, and this reasoning, that the effect of resemblance in enlivening the idea is very common; and as in every case a resemblance and a present impression must concur, we are abundantly supplied with experiments to prove the reality of the foregoing principle.

We may add force to these experiments by others of a different kind, in considering the effects of *contiguity*, as well as of *resemblance*. 'Tis certain that distance diminishes the force of every idea; and that, upon our approach to any object, though it does not discover itself to our senses, it operates upon the mind with an influence that imitates an immediate impression. The thinking on any object readily transports the mind to what is contiguous; but 'tis only the actual presence of an object, that transports it with a superior vivacity. When I am a few miles from home, whatever relates to it touches me more nearly than

when I am two hundred leagues distant; though even at that distance the reflecting on any thing in the neighbourhood of my friends and family naturally produces an idea of them. But as in this latter case, both the objects of the mind are ideas; notwithstanding there is an easy transition betwixt them; that transition alone is not able to give a superior vivacity to any of the ideas, for want of some immediate impression. *

No one can doubt but causation has the same influence as the other two relations of resemblance and contiguity. Superstitious people are fond of the relicks of saints and holy men, for the same reason that they seek after types and images, in order to enliven their devotion, and give them a more intimate and strong conception of those exemplary lives, which they desire to imitate. Now, 'tis evident one of the best relicks a devotee could procure would be the handy-work of a saint; and if his clothes and furniture are ever to be considered in this light, 'tis because they were once at his disposal, and were moved and affected by him; in which respect they are to be considered as imperfect

* Naturane nobis, inquit, datum dicam, an errore quodam, ut, cum ea loca videamus, in quibus memoria dignos viros acceperimus multum esse versatos, magis moveamur, quam siquando eorum ipsorum aut facta audiamus, aut scriptum aliquod legamus? velut ego nunc moveor. Venit enim mihi Platonis in mentem: quem accipimus primum hîc disputare solitum: cujus etiam illi hortuli propinqui non memoriam solûm mihi afferunt, sed ipsum videntur in conspectu meo hic ponere. Hîc Speusippus, hic Xenocrates, hic ejus auditor Polemo; cujus ipsa illa sessio fuit, quam videamus. Equidem etiam curiam nostram, hostiliam dico, non hanc novam, quæ mihi minor esse videtur postquam est major, solebam intuens Scipionem, Catonem, Lælium, nostrum vero in primis avum cogitare. Tanta vis admonitionis inest in locis; ut non sine causa ex his memoriæ ducta sit diciplina.—*Cicero de Finibus, lib. 5.*

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effects, and as connected with him by a shorter chain of consequences than any of those, from which we learn the reality of his existence. This phenomenon clearly proves, that a present impression with a relation of causation may enliven any idea, and consequently produce belief or assent, according to the precedent definition of it.

But why need we seek for other arguments to prove, that a present impression with a relation or transition of the fancy may enliven any idea, when this very instance of our reasonings from cause and effect will alone suffice to that purpose? 'Tis certain we must have an idea of every matter of fact which we believe. 'Tis certain that this idea arises only from a relation to a present impression. 'Tis certain that the belief superadds nothing to the idea, but only changes our manner of conceiving it, and renders it more strong and lively. The present conclusion concerning the influence of relation is the immediate consequence of all these steps; and every step appears to me sure and infallible. There enters nothing into this operation of the mind but a present impression, a lively idea, and a relation or association in the fancy betwixt the impression and idea; so that there can be no suspicion of mistake.

In order to put this whole affair in a fuller light, let us consider it as a question in natural philosophy, which we must determine by experience and observation. I suppose there is an object presented, from which I draw a certain conclusion, and form to myself ideas, which I am said to believe or assent to. Here 'tis evident, that however that object, which is present to my senses, and that other, whose existence I infer by reasoning, may be thought to influence each other by their

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particular powers or qualities; yet as the phenomenon of belief, which we at present examine, is merely internal, these powers and qualities being entirely unknown, can have no hand in producing it. 'Tis the present impression which is to be considered as the true and real cause of the idea, and of the belief which attends it. We must therefore endeavour to discover, by experiments, the particular qualities by which 'tis enabled to produce so extraordinary an effect.

First then I observe, that the present impression has not this effect by its own proper power and efficacy, and, when considered alone as a single perception, limited to the present moment. I find that an impression, from which, on its first appearance, I can draw no conclusion, may afterwards become the foundation of belief, when I have had experience of its usual consequences. We must in every case have observed the same impression in past instances, and have found it to be constantly conjoined with some other impression. This is confirmed by such a multitude of experiments, that it admits not of the smallest doubt.

From a second observation I conclude, that the belief which attends the present impression, and is produced by a number of past impressions and conjunctions; that this belief, I say, arises immediately, without any new operation of the reason or imagination. Of this I can be certain, because I never am conscious of any such operation, and find nothing in the subject on which it can be founded. Now, as we call every thing *custom* which proceeds from a past repetition, without any new reasoning or conclusion, we may establish it as a certain truth, that all the belief, which follows upon any present impression, is derived solely from that origin. When we are accustomed to see

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two impressions conjoined together, the appearance or idea of the one immediately carries us to the idea of the other.

Being fully satisfied on this head, I make a third set of experiments, in order to know whether any thing be requisite, beside the customary transition, towards the production of this phenomenon of belief. I therefore change the first impression into an idea; and observe, that though the customary transition to the correlative idea still remains, yet there is in reality no belief nor persuasion. A present impression, then, is absolutely requisite to this whole operation; and when after this I compare an impression with an idea, and find that their only difference consists in their different degrees of force and vivacity, I conclude upon the whole, that belief is a more vivid and intense conception of an idea, proceeding from its relation to a present impression.

Thus, all probable reasoning is nothing but a species of sensation. 'Tis not solely in poetry and music we must follow our taste and sentiment, but likewise in philosophy. When I am convinced of any principle, 'tis only an idea which strikes more strongly upon me. When I give the preference to one set of arguments above another, I do nothing but decide from my feeling concerning the superiority of their influence. Objects have no discoverable connexion together; nor is it from any other principle but custom operating upon the imagination, that we can draw any inference from the appearance of one to the existence of another.

'Twill here be worth our observation, that the past experience, on which all our judgments concerning cause and effect depend, may operate on our mind in such an insensible manner as never to be taken notice

of, and may even in some measure be unknown to us. A person, who stops short in his journey upon meeting a river in his way, foresees the consequences of his proceeding forward; and his knowledge of these consequences is conveyed to him by past experience, which informs him of such certain conjunctions of causes and effects. But can we think, that on this occasion he reflects on any past experience, and calls to remembrance instances that he has seen or heard of, in order to discover the effects of water on animal bodies? No, surely; this is not the method, in which he proceeds in his reasoning. The idea of sinking is so closely connected with that of water, and the idea of suffocating with that of sinking, that the mind makes the transition without the assistance of the memory. The custom operates before we have time for reflection. The objects seem so inseparable, that we interpose not a moment's delay in passing from the one or the other. But as this transition proceeds from experience, and not from any primary connexion betwixt the ideas, we must necessarily acknowledge, that experience may produce a belief and a judgment of causes and effects by a separate operation, and without being once thought of. This removes all pretext, if there yet remains any, for asserting that the mind is convinced by reasoning of that principle, *that instances of which we have no experience, must necessarily resemble those of which we have.* For we here find, that the understanding or imagination can draw inferences from past experience, without reflecting on it; much more without forming any principle concerning it, or reasoning upon that principle.

In general we may observe, that in all the most established and uniform conjunctions of causes and effects,

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such as those of gravity, impulse, solidity, &c. the mind never carries its view expressly to consider any past experience: though in other associations of objects, which are more rare and unusual, it may assist the custom and transition of ideas by this reflection. Nay we find in some cases, that the reflection produces the belief without the custom; or, more properly speaking, that the reflection produces the custom in an *oblique* and *artificial* manner. I explain myself. 'Tis certain, that not only in philosophy, but even in common life, we may attain the knowledge of a particular cause merely by one experiment, provided it be made with judgment, and after a careful removal of all foreign and superfluous circumstances. Now, as after one experiment of this kind, the mind, upon the appearance either of the cause or the effect, can draw an inference concerning the existence of its correlative, and as a habit can never be acquired merely by one instance, it may be thought that belief cannot in this case be esteemed the effect of custom. But this difficulty will vanish, if we consider, that, though we are here supposed to have had only one experiment of a particular effect, yet we have many millions to convince us of this principle, *that like objects, placed in like circumstances, will always produce like effects*; and as this principle has established itself by a sufficient custom, it bestows an evidence and firmness on any opinion to which it can be applied. The connexion of the ideas is not habitual after one experiment; but this connexion is comprehended under another principle that is habitual; which brings us back to our hypothesis. In all cases we transfer our experience to instances of which we have no experience, either *expressly* or *tacitly*, either *directly* or *indirectly*.

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I must not conclude this subject without observing, that 'tis very difficult to talk of the operations of the mind with perfect propriety and exactness; because common language has seldom made any very nice distinctions among them, but has generally called by the same term all such as nearly resemble each other. And as this is a source almost inevitable of obscurity and confusion in the author, so it may frequently give rise to doubts and objections in the reader, which otherwise he would never have dreamed of. Thus, my general position, that an opinion or belief is *nothing but a strong and lively idea derived from a present impression related to it*, may be liable to the following objection, by reason of a little ambiguity in those words *strong* and *lively*. It may be said, that not only an impression may give rise to reasoning, but that an idea may also have the same influence; especially upon my principle, *that all our ideas are derived from correspondent impressions*. For, suppose I form at present an idea, of which I have forgot the correspondent impression, I am able to conclude, from this idea, that such an impression did once exist; and as this conclusion is attended with belief, it may be asked, from whence are the qualities of force and vivacity derived which constitute this belief? And to this I answer very readily, *from the present idea*. For as this idea is not here considered as the representation of any absent object, but as a real perception in the mind, of which we are intimately conscious, it must be able to bestow, on whatever is related to it, the same quality, call it *firmness, or solidity, or force, or vivacity*, with which the mind reflects upon it, and is assured of its present existence. The idea here supplies the place

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of an impression, and is entirely the same, so far as regards our present purpose.

Upon the same principles we need not be surprised to hear of the remembrance of an idea; that is, of the idea of an idea, and of its force and vivacity superior to the loose conceptions of the imagination. In thinking of our past thoughts we not only delineate out the objects of which we were thinking, but also conceive the action of the mind in the meditation, that certain *je-ne-scai-quoi*, of which 'tis impossible to give any definition or description, but which every one sufficiently understands. When the memory offers an idea of this, and represents it as past, 'tis easily conceived how that idea may have more vigour and firmness than when we think of a past thought of which we have no remembrance.

After this, any one will understand how we may form the idea of an impression and of an idea, and how we may believe the existence of an impression and of an idea.

SECTION IX.

OF THE EFFECTS OF OTHER RELATIONS AND OTHER HABITS.

However convincing the foregoing arguments may appear, we must not rest contented with them, but must turn the subject on every side, in order to find some new points of view, from which we may illustrate

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and confirm such extraordinary and such fundamental principles. A scrupulous hesitation to receive any new hypothesis is so laudable a disposition in philosophers, and so necessary to the examination of truth, that it deserves to be complied with, and requires that every argument be produced which may tend to their satisfaction, and every objection removed which may stop them in their reasoning.

I have often observed, that, beside cause and effect, the two relations of resemblance and contiguity are to be considered as associating principles of thought, and as capable of conveying the imagination from one idea to another. I have also observed, that when of two objects, connected together by any of these relations, one is immediately present to the memory or senses, not only the mind is conveyed to its co-relative by means of the associating principle, but likewise conceives it with an additional force and vigour, by the united operation of that principle, and of the present impression. All this I have observed, in order to confirm, by analogy, my explication of our judgments concerning cause and effect. But this very argument may perhaps be turned against me, and, instead of a confirmation of my hypothesis, may become an objection to it. For it may be said, that if all the parts of that hypothesis be true, viz. *that* these three species of relation are derived from the same principles; *that* their effects, in enforcing and enlivening our ideas, are the same; and *that* belief is nothing but a more forcible and vivid conception of an idea; it should follow, that that action of the mind may not only be derived from the relation of cause and effect, but also from those of contiguity and resemblance. But as we find by experience that belief arises only from causation, and that

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we can draw no inference from one object to another, except they be connected by this relation, we may conclude, that there is some error in that reasoning which leads us into such difficulties.

This is the objection: let us now consider its solution. 'Tis evident, that whatever is present to the memory, striking upon the mind with a vivacity which resembles an immediate impression, must become of considerable moment in all the operations of the mind, and must easily distinguish itself above the mere fictions of the imagination. Of these impressions or ideas of the memory we form a kind of system, comprehending whatever we remember to have been present, either to our internal perception or senses; and every particular of that system, joined to the present impressions, we are pleased to call a *reality*. But the mind stops not here. For finding, that with this system of perceptions there is another connected by custom, or, if you will, by the relation of cause or effect, it proceeds to the consideration of their ideas; and as it feels that 'tis in a manner necessarily determined to view these particular ideas, and that the custom or relation, by which it is determined, admits not of the least change, it forms them into a new system, which it likewise dignifies with the title of *realities*. The first of these systems is the object of the memory and senses; the second of the judgment.

'Tis this latter principle which peoples the world, and brings us acquainted with such existences as, by their removal in time and place, lie beyond the reach of the senses and memory. By means of it I paint the universe in my imagination, and fix my attention on any part of it I please. I form an idea of Rome, which I neither see nor remember, but which is con-

nected with such impressions as I remember to have received from the conversation and books of travellers and historians. This idea of Rome I place in a certain situation on the idea of an object which I call the globe. I join to it the conception of a particular government, and religion and manners. I look backward and consider its first foundation, its several revolutions, successes and misfortunes. All this, and every thing else which I believe, are nothing but ideas, though, by their force and settled order, arising from custom and the relation of cause and effect, they distinguish themselves from the other ideas, which are merely the offspring of the imagination.

As to the influence of contiguity and resemblance, we may observe, that if the contiguous and resembling object be comprehended in this system of realities, there is no doubt but these two relations will assist that of cause and effect, and infix the related idea with more force in the imagination. This I shall enlarge upon presently. Meanwhile I shall carry my observation a step farther, and assert, that even where the related object is but feigned, the relation will serve to enliven the idea, and increase its influence. A poet, no doubt, will be the better able to form a strong description of the Elysian fields, that he prompts his imagination by the view of a beautiful meadow or garden; as at another time he may, by his fancy, place himself in the midst of these fabulous regions, that by the feigned contiguity he may enliven his imagination.

But though I cannot altogether exclude the relations of resemblance and contiguity from operating on the fancy in this manner, 'tis observable that, when single, their influence is very feeble and uncertain. As the relation of cause and effect is requisite to persuade us

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of any real existence, so is this persuasion requisite to give force to these other relations. For where upon the appearance of an impression we not only feign another object, but likewise arbitrarily, and of our mere good-will and pleasure give it a particular relation to the impression, this can have but a small effect upon the mind; nor is there any reason, why, upon the return of the same impression, we should be determined to place the same object in the same relation to it. There is no manner of necessity for the mind to feign any resembling and contiguous objects; and if it feigns such, there is as little necessity for it always to confine itself to the same, without any difference or variation. And indeed such a fiction is founded on so little reason, that nothing but pure *caprice* can determine the mind to form it; and that principle being fluctuating and uncertain, 'tis impossible it can ever operate with any considerable degree of force and constancy. The mind foresees and anticipates the change; and even from the very first instant feels the looseness of its actions, and the weak hold it has of its objects. And as this imperfection is very sensible in every single instance, it still increases by experience and observation, when we compare the several instances we may remember, and form a *general rule* against the reposing any assurance in those momentary glimpses of light, which arise in the imagination from a feigned resemblance and contiguity.

The relation of cause and effect has all the opposite advantages. The objects it presents are fixed and unalterable. The impressions of the memory never change in any considerable degree; and each impression draws along with it a precise idea, which takes its place in the imagination, as something solid and real,

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certain and invariable. The thought is always determined to pass from the impression to the idea, and from that particular impression to that particular idea, without any choice or hesitation.

But not content with removing this objection, I shall endeavour to extract from it a proof of the present doctrine. Contiguity and resemblance have an effect much inferior to causation; but still have some effect, and augment the conviction of any opinion, and the vivacity of any conception. If this can be proved in several new instances, beside what we have already observed, 'twill be allowed no inconsiderable argument, that belief is nothing but a lively idea related to a present impression.

To begin with contiguity; it has been remarked among the Mahometans as well as Christians, that those *pilgrims*, who have seen Mecca or the Holy Land are ever after more faithful and zealous believers, than those who have not had that advantage. A man, whose memory presents him with a lively image of the Red Sea, and the Desert, and Jerusalem, and Galilee, can never doubt of any miraculous events, which are related either by Moses or the Evangelists. The lively idea of the places passes by an easy transition to the facts, which are supposed to have been related to them by contiguity, and increases the belief by increasing the vivacity of the conception. The remembrance of these fields and rivers has the same influence on the vulgar as a new argument, and from the same causes.

We may form a like observation concerning *resemblance*. We have remarked, that the conclusion which we draw from a present object to its absent cause or effect, is never founded on any qualities which we observe in that object, considered in itself; or, in other

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words, that 'tis impossible to determine otherwise than by experience, what will result from any phenomenon, or what has preceded it. But though this be so evident in itself, that it seemed not to require any proof, yet some philosophers have imagined that there is an apparent cause for the communication of motion, and that a reasonable man might immediately infer the motion of one body from the impulse of another, without having recourse to any past observation. That this opinion is false will admit of an easy proof. For if such an inference may be drawn merely from the ideas of body, of motion, and of impulse, it must amount to a demonstration, and must imply the absolute impossibility of any contrary supposition. Every effect, then, beside the communication of motion, implies a formal contradiction; and 'tis impossible not only that it can exist, but also that it can be conceived. But we may soon satisfy ourselves of the contrary, by forming a clear and consistent idea of one body's moving upon another, and of its rest immediately upon the contact; or of its returning back in the same line in which it came; or of its annihilation, or circular or elliptical motion; and in short, of an infinite number of other changes, which they may suppose it to undergo. These suppositions are all consistent and natural; and the reason why we imagine the communication of motion to be more consistent and natural, not only than those suppositions, but also than any other natural effect, is founded on the relation of *resemblance* betwixt the cause and effect, which is here united to experience, and binds the objects in the closest and most intimate manner to each other, so as to make us imagine them to be absolutely inseparable. Resemblance, then, has the same or a parallel influence with experience; and

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as the only immediate effect of experience is to associate our ideas together, it follows that all belief arises from the association of ideas, according to my hypothesis.

'Tis universally allowed by the writers on optics, that the eye at all times sees an equal number of physical points, and that a man on the top of a mountain has no larger an image presented to his senses, than when he is cooped up in the narrowest court or chamber. 'Tis only by experience that he infers the greatness of the object from some peculiar qualities of the image; and this inference of the judgment he confounds with sensation, as is common on other occasions. Now 'tis evident, that the inference of the judgment is here much more lively than what is usual in our common reasonings, and that a man has a more vivid conception of the vast extent of the ocean from the image he receives by the eye, when he stands on the top of the high promontory, than merely from hearing the roaring of the waters. He feels a more sensible pleasure from its magnificence, which is a proof of a more lively idea; and he confounds his judgment with sensation, which is another proof of it. But as the inference is equally certain and immediate in both cases, this superior vivacity of our conception in one case can proceed from nothing but this, that in drawing an inference from the sight, beside the customary conjunction, there is also a resemblance betwixt the image and the object we infer, which strengthens the relation, and conveys the vivacity of the impression to the related idea with an easier and more natural movement.

No weakness of human nature is more universal and conspicuous than what we commonly call *credulity*, or a too easy faith in the testimony of others; and this

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weakness is also very naturally accounted for from the influence of resemblance. When we receive any matter of fact upon human testimony, our faith arises from the very same origin as our inferences from causes to effects, and from effects to causes; nor is there any thing but our *experience* of the governing principles of human nature, which can give us any assurance of the veracity of men. But though experience be the true standard of this, as well as of all other judgments, we seldom regulate ourselves entirely by it, but have a remarkable propensity to believe whatever is reported, even concerning apparitions, enchantments, and prodigies, however contrary to daily experience and observation. The words or discourses of others have an intimate connexion with certain ideas in their mind; and these ideas have also a connexion with the facts or objects which they represent. This latter connexion is generally much over-rated, and commands our assent beyond what experience will justify, which can proceed from nothing beside the resemblance betwixt the ideas and the facts. Other effects only point out their causes in an oblique manner; but the testimony of men does it directly, and is to be considered as an image as well as an effect. No wonder, therefore, we are so rash in drawing our inferences from it, and are less guided by experience in our judgments concerning it, than in those upon any other subject.

As resemblance, when conjoined with causation, fortifies our reasonings, so the want of it in any very great degree is able almost entirely to destroy them. Of this there is a remarkable instance in the universal carelessness and stupidity of men with regard to a future state, where they show as obstinate an incredulity, as they do a blind credulity on other occasions. There is not indeed a more

ample matter of wonder to the studious, and of regret to the pious man, than to observe the negligence of the bulk of mankind concerning their approaching condition; and 'tis with reason, that many eminent theologians have not scrupled to affirm, that though the vulgar have no formal principles of infidelity, yet they are really infidels in their hearts, and have nothing like what we can call a belief of the eternal duration of their souls. For let us consider on the one hand what divines have displayed with such eloquence concerning the importance of eternity; and at the same time reflect, that though in matters of rhetoric we ought to lay our account with some exaggeration, we must in this case allow, that the strongest figures are infinitely inferior to the subject: and after this, let us view on the other hand the prodigious security of men in this particular: I ask, if these people really believe what is inculcated on them, and what they pretend to affirm; and the answer is obviously in the negative. As belief is an act of the mind arising from custom, 'tis not strange the want of resemblance should overthrow what custom has established, and diminish the force of the idea, as much as that latter principle increases it. A future state is so far removed from our comprehension, and we have so obscure an idea of the manner in which we shall exist after the dissolution of the body, that all the reasons we can invent, however strong in themselves, and however much assisted by education, are never able with slow imaginations to surmount this difficulty, or bestow a sufficient authority and force on the idea. I rather choose to ascribe this incredulity to the faint idea we form of our future condition, derived from its want of resemblance to the present life, than to that derived from its remoteness. For I observe,

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that men are every where concerned about what may happen after their death, provided it regard this world; and that there are few to whom their name, their family, their friends, and their country are in any period of time entirely indifferent.

And indeed the want of resemblance in this case so entirely destroys belief, that except those few who, upon cool reflection on the importance of the subject, have taken care by repeated meditation to imprint in their minds the arguments for a future state, there scarce are any who believe the immortality of the soul with a true and established judgment; such as is derived from the testimony of travellers and historians. This appears very conspicuously wherever men have occasion to compare the pleasures and pains, the rewards and punishments of this life with those of a future; even though the case does not concern themselves, and there is no violent passion to disturb their judgment. The Roman Catholics are certainly the most zealous of any sect in the Christian world; and yet you'll find few among the more sensible part of that communion who do not blame the Gunpowder Treason, and the massacre of St Bartholomew, as cruel and barbarous, though projected or executed against those very people, whom without any scruple they condemn to eternal and infinite punishments. All we can say in excuse for this inconsistency is, that they really do not believe what they affirm concerning a future state; nor is there any better proof of it than the very inconsistency.

We may add to this a remark, that in matters of religion men take a pleasure in being terrified, and that no preachers are so popular as those who excite the most dismal and gloomy passions. In the com-

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mon affairs of life, where we feel and are penetrated with the solidity of the subject, nothing can be more disagreeable than fear and terror; and 'tis only in dramatic performances and in religious discourses that they ever give pleasure. In these latter cases the imagination reposes itself indolently on the idea; and the passion being softened by the want of belief in the subject, has no more than the agreeable effect of enlivening the mind and fixing the attention.

The present hypothesis will receive additional confirmation, if we examine the effects of other kinds of custom, as well as of other relations. To understand this we must consider that custom, to which I attribute all belief and reasoning, may operate upon the mind in invigorating an idea after two several ways. For supposing that, in all past experience, we have found two objects to have been always conjoined together, 'tis evident, that upon the appearance of one of these objects in an impression, we must, from custom, make an easy transition to the idea of that object, which usually attends it; and by means of the present impression and easy transition must conceive that idea in a stronger and more lively manner than we do any loose floating image of the fancy. But let us next suppose, that a mere idea alone, without any of this curious and almost artificial preparation, should frequently make its appearance in the mind, this idea must, by degrees, acquire a facility and force; and both by its firm hold and easy introduction distinguish itself from any new and unusual idea. This is the only particular in which these two kinds of custom agree; and if it appear that their effects on the judgment are similar and proportionable, we may certainly conclude, that the foregoing explication of that faculty is satisfactory. But can

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we doubt of this agreement in their influence on the judgment, when we consider the nature and effects of *education?*

All those opinions and notions of things, to which we have been accustomed from our infancy, take such deep root, that 'tis impossible for us, by all the powers of reason and experience, to eradicate them; and this habit not only approaches in its influence, but even on many occasions prevails over that which arises from the constant and inseparable union of causes and effects. Here we must not be contented with saying, that the vividness of the idea produces the belief: we must maintain that they are individually the same. The frequent repetition of any idea infixes it in the imagination; but could never possibly of itself produce belief, if that act of the mind was, by the original constitution of our natures, annexed only to a reasoning and comparison of ideas. Custom may lead us into some false comparison of ideas: This is the utmost effect we can conceive of it; but 'tis certain it could never supply the place of that comparison, nor produce any act of the mind which naturally belonged to that principle.

A person that has lost a leg or an arm by amputation endeavours for a long time afterwards to serve himself with them. After the death of any one, 'tis a common remark of the whole family, but especially the servants, that they can scarce believe him to be dead, but still imagine him to be in his chamber or in any other place, where they were accustomed to find him. I have often heard in conversation, after talking of a person that is any way celebrated, that one, who has no acquaintance with him, will say, *I have never*

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seen such a one, but almost fancy I have, so often have I heard talk of him. All these are parallel instances.

If we consider this argument from *education* in a proper light, 'twill appear very convincing; and the more so, that 'tis founded on one of the most common phenomena that is any where to be met with. I am persuaded that, upon examination, we shall find more than one half of those opinions that prevail among mankind to be owing to education, and that the principles which are thus implicitly embraced, overbalance those, which are owing either to abstract reasoning or experience. As liars, by the frequent repetition of their lies, come at last to remember them; so the judgment, or rather the imagination, by the like means, may have ideas so strongly imprinted on it, and conceive them in so full a light, that they may operate upon the mind in the same manner with those which the senses, memory, or reason present to us. But as education is an artificial and not a natural cause, and as its maxims are frequently contrary to reason, and even to themselves in different times and places, it is never upon that account recognised by philosophers; though in reality it be built almost on the same foundation of custom and repetition as our reasonings from causes and effects. *

* In general we may observe, that as our assent to all probable reasonings is founded on the vivacity of ideas, it resembles many of those whimsies and prejudices which are rejected under the opprobrious character of being the offspring of the imagination. By this expression it appears, that the word imagination, is commonly used in two different senses; and though nothing be more contrary to true philosopy than this inaccuracy, yet, in the following reasonings, I have often been obliged to fall into it. When I oppose the imagination to the memory, I mean the faculty by which we form our fainter ideas. When I oppose it to reason, I mean the same faculty, excluding only our demonstrative and probable reasonings. When I oppose it to neither, 'tis indifferent whether it be taken in the larger or more limited sense, or at least the context will sufficiently explain the meaning.

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But though education be disclaimed by philosophy, as a fallacious ground of assent to any opinion, it prevails nevertheless in the world, and is the cause why all systems are apt to be rejected at first as new and unusual. This, perhaps, will be the fate of what I have here advanced concerning *belief;* and though the proofs I have produced appear to me perfectly conclusive, I expect not to make many proselytes to my opinion. Men will scarce ever be persuaded, that effects of such consequence can flow from principles which are seemingly so inconsiderable, and that the far greatest part of our reasonings, with all our actions and passions, can be derived from nothing but custom and habit. To obviate this objection, I shall here anticipate a little what would more properly fall under our consideration afterwards, when we come to treat of the Passions and the Sense of Beauty.

There is implanted in the human mind a perception of pain and pleasure, as the chief spring and moving principle of all its actions. But pain and pleasure have two ways of making their appearance in the mind; of which the one has effects very different from the other. They may either appear an impression to the actual feeling, or only in idea, as at present when I mention them. 'Tis evident the influence of these upon our actions is far from being equal. Impressions always

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actuate the soul, and that in the highest degree; but 'tis not every idea which has the same effect. Nature has proceeded with caution in this case, and seems to have carefully avoided the inconveniences of two extremes. Did impressions alone influence the will, we should every moment of our lives be subject to the greatest calamities; because, though we foresaw their approach, we should not be provided by nature with any principle of action, which might impel us to avoid them. On the other hand, did every idea influence our actions, our condition would not be much mended. For such is the unsteadiness and activity of thought, that the images of every thing, especially of goods and evils, are always wandering in the mind; and were it moved by every idle conception of this kind, it would never enjoy a moment's peace and tranquillity.

Nature has therefore chosen a medium, and has neither bestowed on every idea of good and evil the power of actuating the will, nor yet has entirely excluded them from this influence. Though an idle fiction has no efficacy, yet we find by experience, that the ideas of those objects, which we believe either are or will be existent, produce in a lesser degree the same effect with those impressions, which are immediately present to the senses and perception. The effect then of belief is to raise up a simple idea to an equality with our impressions, and bestow on it a like influence on the passions. This effect it can only have by making an idea approach an impression in force and vivacity. For as the different degrees of force make all the original difference betwixt an impression and an idea, they must of consequence be the source of all the differences in the effects of these perceptions, and their removal, in whole or in part, the cause of every new re-

semblance they acquire. Wherever we can make an idea approach the impressions in force and vivacity, it will likewise imitate them in its influence on the mind; and *vice versa*, where it imitates them in that influence, as in the present case, this must proceed from its approaching them in force and vivacity. Belief, therefore, since it causes an idea to imitate the effects of the impressions, must make it resemble them in these qualities, and is nothing but *a more vivid and intense conception of any idea.* This then may both serve as an additional argument for the present system, and may give us a notion after what manner our reasonings from causation are able to operate on the will and passions.

As belief is almost absolutely requisite to the exciting our passions, so the passions, in their turn, are very favourable to belief; and not only such facts as convey agreeable emotions, but very often such as give pain, do upon that account become more readily the objects of faith and opinion. A coward, whose fears are easily awakened, readily assents to every account of danger he meets with; as a person of a sorrowful and melancholy disposition is very credulous of every thing that nourishes his prevailing passion. When any affecting object is presented, it gives the alarm, and excites immediately a degree of its proper passion; especially in persons who are naturally inclined to that passion. This emotion passes by an easy transition to the imagination; and, diffusing itself over our idea of the affecting object, makes us form that idea with greater force and vivacity, and consequently assent to it, according to the precedent system. Admiration and surprise have the same effect as the other passions; and accordingly we may observe, that among the vul-

gar, quacks and projectors meet with a more easy faith upon account of their magnificent pretensions, than if they kept themselves within the bounds of moderation. The first astonishment, which naturally attends their miraculous relations, spreads itself over the whole soul, and so vivifies and enlivens the idea, that it resembles the inferences we draw from experience. This is a mystery, with which we may be already a little acquainted, and which we shall have further occasion to be let into in the progress of this Treatise.

After this account of the influence of belief on the passions, we shall find less difficulty in explaining its effects on the imagination, however extraordinary they may appear. 'Tis certain we cannot take pleasure in any discourse, where our judgment gives no assent to those images which are presented to our fancy. The conversation of those, who have acquired a habit of lying, though in affairs of no moment, never gives any satisfaction; and that because those ideas they present to us, not being attended with belief, make no impression upon the mind. Poets themselves, though liars by profession, always endeavour to give an air of truth to their fictions; and where that is totally neglected, their performances, however ingenious, will never be able to afford much pleasure. In short, we may observe, that even when ideas have no manner of influence on the will and passions, truth and reality are still requisite, in order to make them entertaining to the imagination.

But if we compare together all the phenomena that occur on this head, we shall find, that truth, however necessary it may seem in all works of genius, has no other effect than to procure an easy reception for the ideas, and to make the mind acquiesce in them with

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satisfaction, or at least without reluctance. But as this is an effect, which may easily be supposed to flow from that solidity and force, which, according to my system, attend those ideas that are established by reasonings from causation; it follows, that all the influence of belief upon the fancy may be explained from that system. Accordingly we may observe, that wherever that influence arises from any other principles beside truth or reality, they supply its place, and give an equal entertainment to the imagination. Poets have formed what they call a poetical system of things, which, though it be believed neither by themselves nor readers, is commonly esteemed a sufficient foundation for any fiction. We have been so much accustomed to the names of Mars, Jupiter, Venus, that in the same manner as education infixes any opinion, the constant repetition of these ideas makes them enter into the mind with facility, and prevail upon the fancy, without influencing the judgment. In like manner tragedians always borrow their fable, or at least the names of their principal actors, from some known passage in history; and that not in order to deceive the spectators; for they will frankly confess, that truth is not in any circumstance inviolably observed, but in order to procure a more easy reception into the imagination for those extraordinary events, which they represent. But this is a precaution which is not required of comic poets, whose personages and incidents, being of a more familiar kind, enter easily into the conception, and are received without any such formality, even though at first sight they be known to be fictitious, and the pure offspring of the fancy.

This mixture of truth and falsehood in the fables of tragic poets not only serves our present purpose, by

showing that the imagination can be satisfied without any absolute belief or assurance; but may in another view be regarded as a very strong confirmation of this system. 'Tis evident, that poets make use of this artifice of borrowing the names of their persons, and the chief events of their poems, from history, in order to procure a more easy reception for the whole, and cause it to make a deeper impression on the fancy and affections. The several incidents of the piece acquire a kind of relation by being united into one poem or representation; and if any of these incidents be an object of belief, it bestows a force and vivacity on the others, which are related to it. The vividness of the first conception diffuses itself along the relations, and is conveyed, as by so many pipes or canals, to every idea that has any communication with the primary one. This indeed can never amount to a perfect assurance; and that because the union among the ideas is in a manner accidental; but still it approaches so near in its influence, as may convince us that they are derived from the same origin. Belief must please the imagination by means of the force and vivacity which attends it; since every idea, which has force and vivacity, is found to be agreeable to that faculty.

To confirm this we may observe, that the assistance is mutual betwixt the judgment and fancy, as well as betwixt the judgment and passion; and that belief not only gives vigour to the imagination, but that a vigorous and strong imagination is of all talents the most proper to procure belief and authority. 'Tis difficult for us to withhold our assent from what is painted out to us in all the colours of eloquence; and the vivacity produced by the fancy is in many cases greater than that which arises from custom and experience. We

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are hurried away by the lively imagination of our author or companion; and even he himself is often a victim to his own fire and genius.

Nor will it be amiss to remark, that as a lively imagination very often degenerates into madness or folly, and bears it a great resemblance in its operations; so they influence the judgment after the same manner, and produce belief from the very same principles. When the imagination, from any extraordinary ferment of the blood and spirits, acquires such a vivacity as disorders all its powers and faculties, there is no means of distinguishing betwixt truth and falsehood; but every loose fiction or idea, having the same influence as the impressions of the memory, or the conclusions of the judgment, is received on the same footing, and operates with equal force on the passions. A present impression and a customary transition are now no longer necessary to enliven our ideas. Every chimera of the brain is as vivid and intense as any of those inferences, which we formerly dignified with the name of conclusions concerning matters of fact, and sometimes as the present impressions of the senses.

We may observe the same effect of poetry in a lesser degree; and this is common both to poetry and madness, that the vivacity they bestow on the ideas is not derived from the particular situations or connexions of the objects of these ideas, but from the present temper and disposition of the person. But how great soever the pitch may be to which this vivacity rise, 'tis evident, that in poetry it never has the same *feeling* with that which arises in the mind, when we reason, though even upon the lowest species of probability. The mind can easily distinguish betwixt the one and the other; and whatever emotion the po-

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etical enthusiasm may give to the spirits, 'tis still the mere phantom of belief or persuasion. The case is the same with the idea as with the passion it occasions. There is no passion of the human mind but what may arise from poetry; though, at the same time, the *feelings* of the passions are very different when excited by poetical fictions, from what they are when they arise from belief and reality. A passion which is disagreeable in real life, may afford the highest entertainment in a tragedy or epic poem. In the latter case it lies not with that weight upon us: it feels less firm and solid, and has no other than the agreeable effect of exciting the spirits, and rousing the attention. The difference in the passions is a clear proof of a like difference in those ideas from which the passions are derived. Where the vivacity arises from a customary conjunction with a present impression, though the imagination may not, in appearance, be so much moved, yet there is always something more forcible and real in its actions than in the fervours of poetry and eloquence. The force of our mental actions in this case, no more than in any other, is not to be measured by the apparent agitation of the mind. A poetical description may have a more sensible effect on the fancy than an historical narration. It may collect more of those circumstances that form a complete image or picture. It may seem to set the object before us in more lively colours. But still the ideas it presents are different to the *feeling* from those which arise from the memory and the judgment. There is something weak and imperfect amidst all that seeming vehemence of thought and sentiment which attends the fictions of poetry.

We shall afterwards have occasion to remark both

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the resemblances and differences betwixt a poetical enthusiasm and a serious conviction. In the mean time, I cannot forbear observing, that the great difference in their feeling proceeds, in some measure, from reflection and *general rules*. We observe, that the vigour of conception which fictions receive from poetry and eloquence, is a circumstance merely accidental, of which every idea is equally susceptible; and that such fictions are connected with nothing that is real. This observation makes us only lend ourselves, so to speak, to the fiction, but causes the idea to feel very different from the eternal established persuasions founded on memory and custom. They are somewhat of the same kind; but the one is much inferior to the other, both in its causes and effects.

A like reflection on *general rules* keeps us from augmenting our belief upon every increase of the force and vivacity of our ideas. Where an opinion admits of no doubt, or opposite probability, we attribute to it a full conviction; though the want of resemblance, or contiguity, may render its force inferior to that of other opinions. 'Tis thus the understanding corrects the appearances of the senses, and makes us imagine, that an object at twenty foot distance seems even to the eye as large as one of the same dimensions at ten.

We may observe the same effect of poetry in a lesser degree; only with this difference, that the least reflection dissipates the illusions of poetry, and places the objects in their proper light. 'Tis however certain, that in the warmth of a poetical enthusiasm, a poet has a counterfeit belief, and even a kind of vision of his objects; and if there be any shadow of argument to support this belief, nothing contributes more

to his full conviction than a blaze of poetical figures and images, which have their effect upon the poet himself, as well as upon his readers.

SECTION XI.

OF THE PROBABILITY OF CHANCES.

But in order to bestow on this system its full force and evidence, we must carry our eye from it a moment to consider its consequences, and explain, from the same principles, some other species of reasoning which are derived from the same origin.

Those philosophers who have divided human reason into *knowledge and probability*, and have defined the first to be *that evidence which arises from the comparison of ideas*, are obliged to comprehend all our arguments from causes or effects under the general term of probability. But though every one be free to use his terms in what sense he pleases; and accordingly, in the precedent part of this discourse, I have followed this method of expression; 'tis however certain, that in common discourse we readily affirm, that many arguments from causation exceed probability, and may be received as a superior kind of evidence. One would appear ridiculous who would say, that 'tis only probable the sun will rise to-morrow, or that all men must die; though 'tis plain we have no further assurance of these facts than what experience affords us. For this reason t'would perhaps be more convenient, in order at once to preserve the common signification of words,

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and mark the several degrees of evidence, to distinguish human reason into three kinds, viz. *that from knowledge, from proofs, and from probabilities.* By knowledge, I mean the assurance arising from the comparison of ideas. By proofs, those arguments which are derived from the relation of cause and effect, and which are entirely free from doubt and uncertainty. By probability, that evidence which is still attended with uncertainty. 'Tis this last species of reasoning I proceed to examine.

Probability or reasoning from conjecture may be divided into two kinds, viz. that which is founded on *chance*, and that which arises from *causes*. We shall consider each of these in order.

A good summary.

The idea of cause and effect is derived from experience, which, presenting us with certain objects constantly conjoined with each other, produces such a habit of surveying them in that relation, that we cannot, without a sensible violence, survey them in any other. On the other hand, as chance is nothing real in itself, and, properly speaking, is merely the negation of a cause, its influence on the mind is contrary to that of causation; and 'tis essential to it to leave the imagination perfectly indifferent, either to consider the existence or non-existence of that object which is regarded as contingent. A cause traces the way to our thought, and in a manner forces us to survey such certain objects in such certain relations. Chance can only destroy this determination of the thought, and leave the mind in its native situation of indifference; in which, upon the absence of a cause, 'tis instantly reinstated.

Since, therefore, an entire indifference is essential to chance, no one chance can possibly be superior to another, otherwise than as it is composed of a superior

number of equal chances. For if we affirm that one chance can, after any other manner, be superior to another, we must at the same time affirm, that there is something which gives it the superiority, and determines the event rather to that side than the other: that is, in other words, we must allow of a cause, and destroy the supposition of chance, which we had before established. A perfect and total indifference is essential to chance, and one total indifference can never in itself be either superior or inferior to another. This truth is not peculiar to my system, but is acknowledged by every one that forms calculations concerning chances.

And here 'tis remarkable, that though chance and causation be directly contrary, yet 'tis impossible for us to conceive this combination of chances, which is requisite to render one hazard superior to another, without supposing a mixture of causes among the chances, and a conjunction of necessity in some particulars, with a total indifference in others. Where nothing limits the chances, every notion that the most extravagant fancy can form is upon a footing of equality; nor can there be any circumstance to give one the advantage above another. Thus, unless we allow that there are some causes to make the dice fall, and preserve their form in their fall, and lie upon some one of their sides, we can form no calculation concerning the laws of hazard. But supposing these causes to operate, and supposing likewise all the rest to be indifferent and to be determined by chance, 'tis easy to arrive at a notion of a superior combination of chances. A dye that has four sides marked with a certain number of spots, and only two with another, affords us an obvious and easy instance of this superiority. The mind is here limited by the causes to such a precise

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number and quality of the events; and, at the same time, is undetermined in its choice of any particular event.

Proceeding, then, in that reasoning, wherein we have advanced three steps; *that* chance is merely the negation of a cause, and produces a total indifference in the mind; *that* one negation of a cause and one total indifference can never be superior or inferior to another; and *that* there must always be a mixture of causes among the chances, in order to be the foundation of any reasoning. We are next to consider what effect a superior combination of chances can have upon the mind, and after what manner it influences our judgment and opinion. Here we may repeat all the same arguments we employed in examining that belief which arises from causes; and may prove, after the same manner, that a superior number of chances produces our assent neither by *demonstration* nor *probability*. 'Tis indeed evident, that we can never, by the comparison of mere ideas, make any discovery which can be of consequence in this affair, and that 'tis impossible to prove with certainty that any event must fall on that side were there is a superior number of chances. To suppose in this case any certainty, were to overthrow what we have established concerning the opposition of chances, and their perfect equality and indifference.

Should it be said, that though in an opposition of chances, 'tis impossible to determine with *certainty* on which side the event will fall, yet we can pronounce with certainty, that 'tis more likely and probable 'twill be on that side where there is a superior number of chances, than where there is an inferior: should this be said, I would ask, what is here meant by *likelihood*

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and probability? The likelihood and probability of chances is a superior number of equal chances; and consequently, when we say 'tis likely the event will fall on the side which is superior, rather than on the inferior, we do no more than affirm, that where there is a superior number of chances there is actually a superior, and where there is an inferior there is an inferior, which are identical propositions, and of no consequence. The question is, by what means a superior number of equal chances operates upon the mind, and produces belief or assent, since it appears that 'tis neither by arguments derived from demonstration, nor from probability.

In order to clear up this difficulty, we shall suppose a person to take a dye, formed after such a manner as that four of its sides are marked with one figure, or one number of spots, and two with another; and to put this dye into the box with an intention of throwing it: 'tis plain, he must conclude the one figure to be more probable than the other, and give the preference to that which is inscribed on the greatest number of sides. He in a manner believes that this will lie uppermost; though still with hesitation and doubt, in proportion to the number of chances which are contrary: and according as these contrary chances diminish, and the superiority increases on the other side, his belief acquires new degrees of stability and assurance. This belief arises from an operation of the mind upon the simple and limited object before us; and therefore its nature will be the more easily discovered and explained. We have nothing but one single dye to contemplate, in order to comprehend one of the most curious operations of the understanding.

This dye formed as above, contains three circum-

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stances worthy of our attention. First, certain causes, such as gravity, solidity, a cubical figure, &c. which determine it to fall, to preserve its form in its fall, and to turn up one of its sides. Secondly, a certain number of sides, which are supposed indifferent. Thirdly, a certain figure inscribed on each side. These three particulars, form the whole nature of the dye, so far as relates to our present purpose; and consequently are the only circumstances regarded by the mind in its forming a judgment concerning the result of such a throw. Let us therefore consider gradually and carefully what must be the influence of these circumstances on the thought and imagination.

First, we have already observed, that the mind is determined by custom to pass from any cause to its effect, and that upon the appearance of the one, 'tis almost impossible for it not to form an idea of the other. Their constant conjunction in past instances has produced such a habit in the mind, that it always conjoins them in its thought, and infers the existence of the one from that of its usual attendant. When it considers the dye as no longer supported by the box, it cannot without violence regard it as suspended in the air; but naturally places it on the table, and views it as turning up one of its sides. This is the effect of the intermingled causes, which are requisite to our forming any calculation concerning chances.

Secondly, 'tis supposed, that though the dye be necessarily determined to fall, and turn up one of its sides, yet there is nothing to fix the particular side, but that this is determined entirely by chance. The very nature and essence of chance is a negation of causes, and the leaving the mind in a perfect indifference among those events which are supposed contingent. When, there-

fore, the thought is determined by the causes to consider the dye as falling and turning up one of its sides, the chances present all these sides as equal, and make us consider every one of them, one after another, as alike probable and possible. The imagination passes from the cause, viz. the throwing of the dye, to the effect, viz. the turning up one of the six sides; and feels a kind of impossibility both of stopping short in the way, and of forming any other idea. But as all these six sides are incompatible, and the dye cannot turn up above one at once, this principle directs us not to consider all of them at once as lying uppermost, which we look upon as impossible: neither does it direct us with its entire force to any particular side; for in that case this side would be considered as certain and inevitable; but it directs us to the whole six sides after such a manner as to divide its force equally among them. We conclude in general, that some one of them must result from the throw: we run all of them over in our minds: the determination of the thought is common to all; but no more of its force falls to the share of any one, than what is suitable to its proportion with the rest. 'Tis after this manner the original impulse, and consequently the vivacity of thought arising from the causes, is divided and split in pieces by the intermingled chances.

We have already seen the influence of the two first qualities of the dye, viz. the *causes*, and the *number*, and *indifference* of the sides, and have learned how they give an impulse to the thought, and divide that impulse into as many parts as there are units in the number of sides. We must now consider the effects of the third particular, viz. the *figures* inscribed on each side. 'Tis evident, that where several sides have the

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same figure inscribed on them, they must concur in their influence on the mind, and must unite upon one image or idea of a figure all those divided impulses, that were dispersed over the several sides, upon which that figure is inscribed. Were the question only what side will be turned up, these are all perfectly equal, and no one could ever have any advantage above another. But as the question is concerning the figure, and as the same figure is presented by more than one side, 'tis evident that the impulses belonging to all these sides must re-unite in that one figure, and become stronger and more forcible by the union. Four sides are supposed in the present case to have the same figure inscribed on them, and two to have another figure. The impulses of the former are therefore superior to those of the latter. But as the events are contrary, and 'tis impossible both these figures can be turned up; the impulses likewise become contrary, and the inferior destroys the superior, as far as its strength goes. The vivacity of the idea is always proportionable to the degrees of the impulse or tendency to the transition; and belief is the same with the vivacity of the idea, according to the precedent doctrine.

SECTION XII.

OF THE PROBABILITY OF CAUSES.

WHAT I have said concerning the probability of chances, can serve to no other purpose than to assist us in explaining the probability of causes; since 'tis

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commonly allowed by philosophers, that what the vulgar call chance is nothing but a secret and concealed cause. That species of probability, therefore, is what we must chiefly examine.

The probabilities of causes are of several kinds; but are all derived from the same origin, viz. *the association of ideas to a present impression.* As the habit which produces the association, arises from the frequent conjunction of objects, it must arrive at its perfection by degrees, and must acquire new force from each instance that falls under our observation. The first instance has little or no force: the second makes some addition to it: the third becomes still more sensible; and 'tis by these slow steps that our judgment arrives at a full assurance. But before it attains this pitch of perfection, it passes through several inferior degrees, and in all of them is only to be esteemed a presumption or probability. The gradation therefore from probabilities to proofs is in many cases insensible; and the difference betwixt these kinds of evidence is more easily perceived in the remote degrees, than in the near and contiguous.

'Tis worthy of remark on this occasion, that though the species of probability here explained be the first in order, and naturally takes place before any entire proof can exist, yet no one, who is arrived at the age of maturity, can any longer be acquainted with it. 'Tis true, nothing is more common than for people of the most advanced knowledge to have attained only an imperfect experience of many particular events; which naturally produces only an imperfect habit and transition: but then we must consider, that the mind, having formed another observation concerning the connexion of causes and effects, gives new force to its reasoning

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from that observation; and by means of it can build an argument on one single experiment, when duly prepared and examined. What we have found once to follow from any object, we conclude will for ever follow from it; and if this maxim be not always built upon as certain, 'tis not for want of a sufficient number of experiments, but because we frequently meet with instances to the contrary; which leads us to the second species of probability, where there is a *contrariety* in our experience and observation.

'Twould be very happy for men in the conduct of their lives and actions, were the same objects always conjoined together, and we had nothing to fear but the mistakes of our own judgment, without having any reason to apprehend the uncertainty of nature. But as 'tis frequently found, that one observation is contrary to another, and that causes and effects follow not in the same order, of which we have had experience, we are obliged to vary our reasoning on account of this uncertainty, and take into consideration the contrariety of events. The first question that occurs on this head, is concerning the nature and causes of the contrariety.

The vulgar, who take things according to their first appearance, attribute the uncertainty of events to such an uncertainty in the causes, as makes them often fail of their usual influence, though they meet with no obstacle nor impediment in their operation. But philosophers observing, that almost in every part of nature there is contained a vast variety of springs and principles, which are hid, by reason of their minuteness or remoteness, find that 'tis at least possible the contrariety of events may not proceed from any contingency in the cause, but from the secret operation of contrary

causes. This possibility is converted into certainty by farther observation, when they remark, that upon an exact scrutiny, a contrariety of effects always betrays a contrariety of causes, and proceeds from their mutual hinderance and opposition. A peasant can give no better reason for the stopping of any clock or watch than to say, that commonly it does not go right: but an artisan easily perceives, that the same force in the spring or pendulum has always the same influence on the wheels; but fails of its usual effect, perhaps by reason of a grain of dust, which puts a stop to the whole movement. From the observation of several parallel instances, philosophers form a maxim, that the connexion betwixt all causes and effects is equally necessary, and that its seeming uncertainty in some instances proceeds from the secret opposition of contrary causes.

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But however philosophers and the vulgar may differ in their explication of the contrariety of events, their inferences from it are always of the same kind, and founded on the same principles. A contrariety of events in the past may give us a kind of hesitating belief for the future, after two several ways. First, by producing an imperfect habit and transition from the present impression to the related idea. When the conjunction of any two objects is frequent, without being entirely constant, the mind is determined to pass from one object to the other; but not with so entire a habit, as when the union is uninterrupted, and all the instances we have ever met with are uniform and of a piece. We find from common experience, in our actions as well as reasonings, that a constant perseverance in any course of life produces a strong inclination and tendency to continue for the future; though there

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are habits of inferior degrees of force, proportioned to the inferior degrees of steadiness and uniformity in our conduct.

There is no doubt but this principle sometimes takes place, and produces those inferences we draw from contrary phenomena; though I am persuaded that, upon examination, we shall not find it to be the principle that most commonly influences the mind in this species of reasoning. When we follow only the habitual determination of the mind, we make the transition without any reflection, and interpose not a moment's delay betwixt the view of one object, and the belief of that which is often found to attend it. As the custom depends not upon any deliberation, it operates immediately, without allowing any time for reflection. But this method of proceeding we have but few instances of in our probable reasonings; and even fewer than in those, which are derived from the uninterrupted conjunction of objects. In the former species of reasoning we commonly take knowingly into consideration the contrariety of past events; we compare the different sides of the contrariety, and carefully weigh the experiments, which we have on each side: whence we may conclude, that our reasonings of this kind arise not *directly* from the habit, but in an *oblique* manner; which we must now endeavour to explain.

'Tis evident, that when an object is attended with contrary effects, we judge of them only by our past experience, and always consider those as possible, which we have observed to follow from it. And as past experience regulates our judgment concerning the possibility of these effects, so it does that concerning their probability; and that effect, which has been the most common, we always esteem the most likely.

Here then are two things to be considered, viz. the *reasons* which determine us to make the past a standard for the future, and the *manner* how we extract a single judgment from a contrariety of past events.

First we may observe, that the supposition, *that the future resembles the past*, is not founded on arguments of any kind, but is derived entirely from habit, by which we are determined to expect for the future the same train of objects to which we have been accustomed. This habit or determination to transfer the past to the future is full and perfect; and consequently the first impulse of the imagination in this species of reasoning is endowed with the same qualities.

But, *secondly*, when in considering past experiments we find them of a contrary nature, this determination, though full and perfect in itself, presents us with no steady object, but offers us a number of disagreeing images in a certain order and proportion. The first impulse therefore is here broke into pieces, and diffuses itself over all those images, of which each partakes an equal share of that force and vivacity that is derived from the impulse. Any of these past events may again happen; and we judge, that when they do happen, they will be mixed in the same proportion as in the past.

If our intention, therefore, be to consider the proportions of contrary events in a great number of instances, the images presented by our past experience must remain in their *first form*, and preserve their first proportions. Suppose, for instance, I have found, by long observation, that of twenty ships which go to sea, only nineteen return. Suppose I see at present twenty ships that leave the port: I transfer my past experience to the future, and represent to myself nineteen of these

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ships as returning in safety, and one as perishing. Concerning this there can be no difficulty. But as we frequently run over those several ideas of past events, in order to form a judgment concerning one single event, which appears uncertain; this consideration must change the *first form* of our ideas, and draw together the divided images presented by experience; since 'tis to *it* we refer the determination of that particular event, upon which we reason. Many of these images are supposed to concur, and a superior number to concur on one side. These agreeing images unite together, and render the idea more strong and lively, not only than a mere fiction of the imagination, but also than any idea, which is supported by a lesser number of experiments. Each new experiment is as a new stroke of the pencil, which bestows an additional vivacity on the colours, without either multiplying or enlarging the figure. This operation of the mind has been so fully explained in treating of the probability of chance, that I need not here endeavour to render it more intelligible. Every past experiment may be considered as a kind of chance; it being uncertain to us, whether the object will exist conformable to one experiment or another; and for this reason every thing that has been said on the one subject is applicable to both.

Thus, upon the whole, contrary experiments produce an imperfect belief, either by weakening the habit, or by dividing and afterwards joining in different parts, that *perfect* habit, which makes us conclude in general, that instances, of which we have no experience, must necessarily resemble those of which we have.

To justify still farther this account of the second species of probability, where we reason with know-

ledge and reflection from a contrariety of past experiments, I shall propose the following considerations, without fearing to give offence by that air of subtilty, which attends them. Just reasoning ought still, perhaps, to retain its force, however subtile; in the same manner as matter preserves its solidity in the air, and fire, and animal spirits, as well as in the grosser and more sensible forms.

First, we may observe, that there is no probability so great as not to allow of a contrary possibility; because otherwise 'twould cease to be a probability, and would become a certainty. That probability of causes, which is most extensive, and which we at present examine, depends on a contrariety of experiments; and 'tis evident an experiment in the past proves at least a possibility for the future.

Secondly, the component parts of this possibility and probability are of the same nature, and differ in number only, but not in kind. It has been observed, that all single chances are entirely equal, and that the only circumstance, which can give any event that is contingent a superiority over another, is a superior number of chances. In like manner, as the uncertainty of causes is discovered by experience, which presents us with a view of contrary events, 'tis plain that, when we transfer the past to the future, the known to the unknown, every past experiment has the same weight, and that 'tis only a superior number of them, which can throw the balance on any side. The possibility, therefore, which enters into every reasoning of this kind, is composed of parts, which are of the same nature both among themselves, and with those that compose the opposite probability.

Thirdly, we may establish it as a certain maxim,

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that in all moral as well as natural phenomena, wherever any cause consists of a number of parts, and the effect increases or diminishes, according to the variation of that number, the effect, properly speaking, is a compounded one, and arises from the union of the several effects, that proceed from each part of the cause. Thus, because the gravity of a body increases or diminishes by the increase or diminution of its parts, we conclude each part contains this quality, and contributes to the gravity of the whole. The absence or presence of a part of the cause is attended with that of a proportionable part of the effect. This connexion or constant conjunction sufficiently proves the one part to be the cause of the other. As the belief, which we have of any event, increases or diminishes according to the number of chances or past experiments, 'tis to be considered as a compounded effect, of which each part arises from a proportionable number of chances or experiments.

Let us now join these three observations, and see what conclusion we can draw from them. To every probability there is an opposite possibility. This possibility is composed of parts that are entirely of the same nature with those of the probability; and consequently have the same influence on the mind and understanding. The belief which attends the probability, is a compounded effect, and is formed by the concurrence of the several effects, which proceed from each part of the probability. Since, therefore, each part of the probability contributes to the production of the belief, each part of the possibility must have the same influence on the opposite side; the nature of these parts being entirely the same. The contrary belief attending the possibility, implies a view of a certain object,

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as well as the probability does an opposite view. In this particular, both these degrees of belief are alike. The only manner then, in which the superior number of similar component parts in the one can exert its influence, and prevail above the inferior in the other, is by producing a stronger and more lively view of its object. Each part presents a particular view; and all these views uniting together produce one general view, which is fuller and more distinct by the greater number of causes or principles from which it is derived.

The component parts of the probability and possibility being alike in their nature, must produce like effects; and the likeness of their effects consists in this, that each of them presents a view of a particular object. But though these parts be alike in their nature, they are very different in their quantity and number; and this difference must appear in the effect as well as the similarity. Now, as the view they present is in both cases full and entire, and comprehends the object in all its parts, 'tis impossible that, in this particular, there can be any difference; nor is there any thing but a superior vivacity in the probability, arising from the concurrence of a superior number of views, which can distinguish these effects.

Here is almost the same argument in a different light. All our reasonings concerning the probability of causes are founded on the transferring of past to future. The transferring of any past experiment to the future is sufficient to give us a view of the object; whether that experiment be single or combined with others of the same kind; whether it be entire, or opposed by others of a contrary kind. Suppose then it acquires both these qualities of combination and oppo-

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sition, it loses not, upon that account, its former power of presenting a view of the object, but only concurs with and opposes other experiments that have a like influence. A question, therefore, may arise concerning the manner both of the concurrence and opposition. As to the *concurrence* there is only the choice left betwixt these two hypotheses. *First*, that the view of the object, occasioned by the transference of each past experiment, preserves itself entire, and only multiplies the number of views. Or, *secondly*, that it runs into the other similar and correspondent views, and gives them a superior degree of force and vivacity. But that the first hypothesis is erroneous, is evident from experience, which informs us, that the belief attending any reasoning consists in one conclusion, not in a multitude of similar ones, which would only distract the mind, and, in many cases, would be too numerous to be comprehended distinctly by any finite capacity. It remains, therefore, as the only reasonable opinion, that these similar views run into each other and unite their forces; so as to produce a stronger and clearer view than what arises from any one alone. This is the manner in which past experiments concur when they are transferred to any future event. As to the manner of their *opposition*, 'tis evident that, as the contrary views are incompatible with each other, and 'tis impossible the object can at once exist conformable to both of them, their influence becomes mutually destructive, and the mind is determined to the superior only with that force which remains after subtracting the inferior.

I am sensible how abstruse all this reasoning must appear to the generality of readers, who, not being accustomed to such profound reflections on the intel-

lectual faculties of the mind, will be apt to reject as chimerical whatever strikes not in with the common received notions, and with the easiest and most obvious principles of philosophy. And, no doubt, there are some pains required to enter into these arguments; though perhaps very little are necessary to perceive the imperfection of every vulgar hypothesis on this subject, and the little light, which philosophy can yet afford us in such sublime and such curious speculations. Let men be once fully persuaded of these two principles, *that there is nothing in any object, considered in itself, which can afford us a reason for drawing a conclusion beyond it*; and, *that even after the observation of the frequent or constant conjunction of objects, we have no reason to draw any inference concerning any object beyond those of which we have had experience*; I say, let men be once fully convinced of these two principles, and this will throw them so loose from all common systems, that they will make no difficulty of receiving any, which may appear the most extraordinary. These principles we have found to be sufficiently convincing, even with regard to our most certain reasonings from causation; but I shall venture to affirm, that with regard to these conjectural or probable reasonings they still acquire a new degree of evidence.

First, 'tis obvious that, in reasonings of this kind, 'tis not the object presented to us, which, considered in itself, affords us any reason to draw a conclusion concerning any other object or event. For as this latter object is supposed uncertain, and as the uncertainty is derived from a concealed contrariety of causes in the former, were any of the causes placed in the known qualities of that object, they would no longer be concealed, nor would our conclusion be uncertain,

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But, *secondly*, 'tis equally obvious in this species of reasoning, that if the transference of the past to the future were founded merely on a conclusion of the understanding, it could never occasion any belief or assurance. When we transfer contrary experiments to the future, we can only repeat these contrary experiments with their particular proportions; which could not produce assurance in any single event upon which we reason, unless the fancy melted together all those images that concur, and extracted from them one single idea or image, which is intense and lively in proportion to the number of experiments from which it is derived, and their superiority above their antagonists. Our past experience presents no determinate object; and as our belief, however faint, fixes itself on a determinate object, 'tis evident that the belief arises not merely from the transference of past to future, but from some operation of the *fancy* conjoined with it. This may lead us to conceive the manner in which that faculty enters into all our reasonings.

I shall conclude this subject with two reflections which may deserve our attention. The *first* may be explained after this manner: When the mind forms a reasoning concerning any matter of fact, which is only probable, it casts its eye backward upon past experience, and, transferring it to the future, is presented with so many contrary views of its object, of which those that are of the same kind uniting together and running into one act of the mind, serve to fortify and enliven it. But suppose that this multitude of views or glimpses of an object proceeds not from experience, but from a voluntary act of the imagination; this effect does not follow, or, at least, follows not in the same degree. For though custom and education pro-

duce belief by such a repetition as is not derived from experience, yet this requires a long tract of time, along with a very frequent and *undesigned* repetition. In general we may pronounce, that a person, who would *voluntarily* repeat any idea in his mind, though supported by one past experience, would be no more inclined to believe the existence of its object, than if he had contented himself with one survey of it. Beside the effect of design, each act of the mind, being separate and independent, has a separate influence, and joins not its force with that of its fellows. Not being united by any common object producing them, they have no relation to each other; and consequently make no transition or union of forces. This phenomenon we shall understand better afterwards.

My *second* reflection is founded on those large probabilities which the mind can judge of, and the minute differences it can observe betwixt them. When the chances or experiments on one side amount to ten thousand, and on the other to ten thousand and one, the judgment gives the preference to the latter upon account of that superiority; though 'tis plainly impossible for the mind to run over every particular view, and distinguish the superior vivacity of the image arising from the superior number, where the difference is so inconsiderable. We have a parallel instance in the affections. 'Tis evident, according to the principles above mentioned, that when an object produces any passion in us, which varies according to the different quantity of the object; I say, 'tis evident, that the passion, properly speaking, is not a simple emotion, but a compounded one, of a great number of weaker passions, derived from a view of each part of the object; for otherwise 'twere impossible the passion should in-

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crease by the increase of these parts. Thus, a man who desires a thousand pounds has, in reality, a thousand or more desires which, uniting together, seem to make only one passion; though the composition evidently betrays itself upon every alteration of the object, by the preference he gives to the larger number, if superior only by an unit. Yet nothing can be more certain, than that so small a difference would not be discernible in the passions, nor could render them distinguishable from each other. The difference, therefore, of our conduct in preferring the greater number depends not upon our passions, but upon custom and *general rules*. We have found in a multitude of instances that the augmenting the numbers of any sum augments the passion, where the numbers are precise and the difference sensible. The mind can perceive, from its immediate feeling, that three guineas produce a greater passion than two; and *this* it transfers to larger numbers, because of the resemblance; and by a general rule assigns to a thousand guineas a stronger passion than to nine hundred and ninety-nine. These general rules we shall explain presently.

But beside these two species of probability, which are derived from an *imperfect* experience and from *contrary* causes, there is a third arising from *analogy*, which differs from them in some material circumstances. According to the hypothesis above explained, all kinds of reasoning from causes or effects are founded on two particulars, viz. the constant conjunction of any two objects in all past experience, and the resemblance of a present object to any one of them. The effect of these two particulars is, that the present object invigorates and enlivens the imagination; and the resemblance, along with the constant union,

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conveys this force and vivacity to the related idea; which we are therefore said to believe or assent to. If you weaken either the union or resemblance, you weaken the principle of transition, and of consequence that belief which arises from it. The vivacity of the first impression cannot be fully conveyed to the related idea, either where the conjunction of their objects is not constant, or where the present impression does not perfectly resemble any of those whose union we are accustomed to observe. In those probabilities of chance and causes above explained, 'tis the constancy of the union which is diminished; and in the probability derived from analogy, 'tis the resemblance only which is affected. Without some degree of resemblance, as well as union, 'tis impossible there can be any reasoning. But as this resemblance admits of many different degrees, the reasoning becomes proportionably more or less firm and certain. An experiment loses of its force, when transferred to instances which are not exactly resembling; though 'tis evident it may still retain as much as may be the foundation of probability, as long as there is any resemblance remaining.

SECTION XIII.

OF UNPHILOSOPHICAL PROBABILITY.

All these kinds of probability are received by philosophers, and allowed to be reasonable foundations of belief and opinion. But there are others that are de-

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rived from the same principles, though they have not had the good fortune to obtain the same sanction. The *first* probability of this kind may be accounted for thus. The diminution of the union and of the resemblance, as above explained, diminishes the facility of the transition, and by that means weakens the evidence; and we may farther observe, that the same diminution of the evidence will follow from a diminution of the impression, and from the shading of those colours under which it appears to the memory or senses. The argument which we found on any matter of fact we remember is more or less convincing, according as the fact is recent or remote; and though the difference in these degrees of evidence be not received by philosophy as solid and legitimate; because in that case an argument must have a different force to-day from what it shall have a month hence; yet, notwithstanding the opposition of philosophy, 'tis certain this circumstance has a considerable influence on the understanding, and secretly changes the authority of the same argument, according to the different times in which it is proposed to us. A greater force and vivacity in the impression naturally conveys a greater to the related idea; and 'tis on the degrees of force and vivacity that the belief depends, according to the foregoing system.

There is a *second* difference which we may frequently observe in our degrees of belief and assurance, and which never fails to take place, though disclaimed by philosophers. An experiment that is recent and fresh in the memory, affects us more than one that is in some measure obliterated; and has a superior influence on the judgment as well as on the passions. A lively impression produces more assurance than a faint

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one, because it has more original force to communicate to the related idea, which thereby acquires a greater force and vivacity. A recent observation has a like effect; because the custom and transition is there more entire, and preserves better the original force in the communication. Thus a drunkard, who has seen his companion die of a debauch, is struck with that instance for some time, and dreads a like accident for himself; but as the memory of it decays away by degrees, his former security returns, and the danger seems less certain and real.

I add, as a *third* instance of this kind, that though our reasonings from proofs and from probabilities be considerably different from each other, yet the former species of reasoning often degenerates insensibly into the latter, by nothing but the multitude of connected arguments. 'Tis certain, that when an inference is drawn immediately from an object, without any intermediate cause or effect, the conviction is much stronger, and the persuasion more lively, than when the imagination is carried through a long chain of connected arguments, however infallible the connexion of each link may be esteemed. 'Tis from the original impression that the vivacity of all the ideas is derived, by means of the customary transition of the imagination; and 'tis evident this vivacity must gradually decay in proportion to the distance, and must lose somewhat in each transition. Sometimes this distance has a greater influence than even contrary experiments would have; and a man may receive a more lively conviction from a probable reasoning which is close and immediate, than from a long chain of consequences, though just and conclusive in each part. Nay, 'tis seldom such reasonings produce any conviction; and one

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must have a very strong and firm imagination to preserve the evidence to the end, where it passes through so many stages.

But here it may not be amiss to remark a very curious phenomenon which the present subject suggests to us. 'Tis evident there is no point of ancient history, of which we can have any assurance, but by passing through many millions of causes and effects, and through a chain of arguments of almost an immeasurable length. Before the knowledge of the fact could come to the first historian, it must be conveyed through many mouths; and after it is committed to writing, each new copy is a new object, of which the connexion with the foregoing is known only by experience and observation. Perhaps therefore it may be concluded, from the precedent reasoning, that the evidence of all ancient history must now be lost, or at least will be lost in time, as the chain of causes increases, and runs on to a greater length. But as it seems contrary to common sense to think, that if the republic of letters and the art of printing continue on the same footing as at present, our posterity, even after a thousand ages, can ever doubt if there has been such a man as Julius Cæsar; this may be considered as an objection to the present system. If belief consisted only in a certain vivacity, conveyed from an original impression, it would decay by the length of the transition, and must at last be utterly extinguished. And, *vice versa*, if belief, on some occasions, be not capable of such an extinction, it must be something different from that vivacity.

Before I answer this objection I shall observe, that from this topic there has been borrowed a very celebrated argument against the *Christian Religion*; but

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with this difference, that the connexion betwixt each link of the chain in human testimony has been there supposed not to go beyond probability, and to be liable to a degree of doubt and uncertainty. And indeed it must be confessed, that in this manner of considering the subject (which, however, is not a true one), there is no history or tradition but what must in the end lose all its force and evidence. Every new probability diminishes the original conviction; and, however great that conviction may be supposed, 'tis impossible it can subsist under such reiterated diminutions. This is true in general, though we shall find afterwards, * that there is one very memorable exception, which is of vast consequence in the present subject of the understanding.

Meanwhile, to give a solution of the preceding objection upon the supposition that historical evidence amounts at first to an entire proof, let us consider, that, though the links are innumerable that connect any original fact with the present impression, which is the foundation of belief, yet they are all of the same kind, and depend on the fidelity of printers and copists. One edition passes into another, and that into a third, and so on, till we come to that volume we peruse at present. There is no variation in the steps. After we know one, we know all of them; and after we have made one, we can have no scruple as to the rest. This circumstance alone preserves the evidence of history, and will perpetuate the memory of the present age to the latest posterity. If all the long chain of causes and effects, which connect any past event with any volume of history, were composed of parts differ-

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ent from each other, and which 'twere necessary for the mind distinctly to conceive, 'tis impossible we should preserve to the end any belief or evidence. But as most of these proofs are perfectly resembling, the mind runs easily along them, jumps from one part to another with facility, and forms but a confused and general notion of each link. By this means, a long chain of argument has as little effect in diminishing the original vivacity, as a much shorter would have if composed of parts which were different from each other, and of which each required a distinct consideration.

A fourth unphilosophical species of probability is that derived from *general rules*, which we rashly form to ourselves, and which are the source of what we properly call *prejudice*. An Irishman cannot have wit, and a Frenchman cannot have solidity; for which reason, though the conversation of the former in any instance be visibly very agreeable, and of the latter very judicious, we have entertained such a prejudice against them, that they must be dunces or fops in spite of sense and reason. Human nature is very subject to errors of this kind, and perhaps this nation as much as any other.

Should it be demanded why men form general rules, and allow them to influence their judgment, even contrary to present observation and experience, I should reply, that in my opinion it proceeds from those very principles on which all judgments concerning causes and effects depend. Our judgments concerning cause and effect are derived from habit and experience; and when we have been accustomed to see one object united to another, our imagination passes from the first to the second by a natural transition, which precedes re-

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flection, and which cannot be prevented by it. Now, 'tis the nature of custom not only to operate with its full force, when objects are presented that are exactly the same with those to which we have been accustomed, but also to operate in an inferior degree when we discover such as are similar; and though the habit loses somewhat of its force by every difference, yet 'tis seldom entirely destroyed where any considerable circumstances remain the same. A man who has contracted a custom of eating fruit by the use of pears or peaches, will satisfy himself with melons where he cannot find his favourite fruit; as one, who has become a drunkard by the use of red wines, will be carried almost with the same violence to white, if presented to him. From this principle I have accounted for that species of probability, derived from analogy, where we transfer our experience in past instances to objects which are resembling, but are not exactly the same with those concerning which we have had experience. In proportion as the resemblance decays, the probability diminishes, but still has some force as long as there remain any traces of the resemblance.

This observation we may carry farther, and may remark, that though custom be the foundation of all our judgments, yet sometimes it has an effect on the imagination in opposition to the judgment, and produces a contrariety in our sentiments concerning the same object. I explain myself. In almost all kinds of causes there is a complication of circumstances, of which some are essential, and others superfluous; some are absolutely requisite to the production of the effect, and others are only conjoined by accident. Now we may observe, that when these superfluous circumstances are numerous and remarkable, and frequently conjoined

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with the essential, they have such an influence on the imagination, that even in the absence of the latter they carry us on to the conception of the usual effect, and give to that conception a force and vivacity which make it superior to the mere fictions of the fancy. We may correct this propensity by a reflection on the nature of those circumstances; but 'tis still certain, that custom takes the start, and gives a bias to the imagination.

To illustrate this by a familiar instance, let us consider the case of a man, who, being hung out from a high tower in a cage of iron, cannot forbear trembling when he surveys the precipice below him, though he knows himself to be perfectly secure from falling, by his experience of the solidity of the iron which supports him, and though the ideas of fall and descent, and harm and death, be derived solely from custom and experience. The same custom goes beyond the instances from which it is derived, and to which it perfectly corresponds; and influences his ideas of such objects as are in some respect resembling, but fall not precisely under the same rule. The circumstances of depth and descent strike so strongly upon him, that their influence cannot be destroyed by the contrary circumstances of support and solidity, which ought to give him a perfect security. His imagination runs away with its object, and excites a passion proportioned to it. That passion returns back upon the imagination, and enlivens the idea; which lively idea has a new influence on the passion, and in its turn augments its force and violence: and both his fancy and affections, thus mutually supporting each other, cause the whole to have a very great influence upon him.

But why need we seek for other instances, while the present subject of philosophical probabilities offers us

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so obvious an one, in the opposition betwixt the judgment and imagination, arising from these effects of custom? According to my system, all reasonings are nothing but the effects of custom, and custom has no influence, but by enlivening the imagination, and giving us a strong conception of any object. It may therefore be concluded, that our judgment and imagination can never be contrary, and that custom cannot operate on the latter faculty after such a manner, as to render it opposite to the former. This difficulty we can remove after no other manner, than by supposing the influence of general rules. We shall afterwards * take notice of some general rules, by which we ought to regulate our judgment concerning causes and effects; and these rules are formed on the nature of our understanding, and on our experience of its operations in the judgments we form concerning objects. By them we learn to distinguish the accidental circumstances from the efficacious causes; and when we find that an effect can be produced without the concurrence of any particular circumstance, we conclude that that circumstance makes not a part of the efficacious cause, however frequently conjoined with it. But as this frequent conjunction necessarily makes it have some effect on the imagination, in spite of the opposite conclusion from general rules, the opposition of these two principles produces a contrariety in our thoughts, and causes us to ascribe the one inference to our judgment, and the other to our imagination. The general rule is attributed to our judgment, as being more extensive and constant; the exception to the imagination, as being more capricious and uncertain.

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Thus, our general rules are in a manner set in opposition to each other. When an object appears, that resembles any cause in very considerable circumstances, the imagination naturally carries us to a lively conception of the usual effect, though the object be different in the most material and most efficacious circumstances from that cause. Here is the first influence of general rules. But when we take a review of this act of the mind, and compare it with the more general and authentic operations of the understanding, we find it to be of an irregular nature, and destructive of all the most established principles of reasonings, which is the cause of our rejecting it. This is a second influence of general rules, and implies the condemnation of the former. Sometimes the one, sometimes the other prevails, according to the disposition and character of the person. The vulgar are commonly guided by the first, and wise men by the second. Meanwhile the sceptics may here have the pleasure of observing a new and signal contradiction in our reason, and of seeing all philosophy ready to be subverted by a principle of human nature, and again saved by a new direction of the very same principle. The following of general rules is a very unphilosophical species of probability; and yet 'tis only by following them that we can correct this, and all other unphilosophical probabilities.

Since we have instances where general rules operate on the imagination, even contrary to the judgment, we need not be surprised to see their effects increase, when conjoined with that latter faculty, and to observe that they bestow on the ideas they present to us a force superior to what attends any other. Every one knows there is an indirect manner of insinuating praise or blame, which is much less shocking than the open

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flattery or censure of any person. However he may communicate his sentiments by such secret insinuations, and make them known with equal certainty as by the open discovery of them, 'tis certain that their influence is not equally strong and powerful. One who lashes me with concealed strokes of satire, moves not my indignation to such a degree, as if he flatly told me I was a fool and a coxcomb; though I equally understand his meaning, as if he did. This difference is to be attributed to the influence of general rules.

Whether a person openly abuses me, or slily intimates his contempt, in neither case do I immediately perceive his sentiment or opinion; and 'tis only by signs, that is, by its effects, I become sensible of it. The only difference then, betwixt these two cases, consists in this, that in the open discovery of his sentiments he makes use of signs, which are general and universal; and in the secret intimation employs such as are more singular and uncommon. The effect of this circumstance is, that the imagination, in running from the present impression to the absent idea, makes the transition with greater facility, and consequently conceives the object with greater force, where the connexion is common and universal, than where it is more rare and particular. Accordingly, we may observe, that the open declaration of our sentiments is called the taking off the mask, as the secret intimation of our opinions is said to be the veiling of them. The difference betwixt an idea produced by a general connexion, and that arising from a particular one, is here compared to the difference betwixt an impression and an idea. This difference in the imagination has a suitable effect on the passions, and this effect is augmented by another circumstance. A secret intimation of

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anger or contempt shows that we still have some consideration for the person, and avoid the directly abusing him. This makes a concealed satire less disagreeable, but still this depends on the same principle. For if an idea were not more feeble, when only intimated, it would never be esteemed a mark of greater respect to proceed in this method than in the other.

Sometimes scurrility is less displeasing than delicate satire, because it revenges us in a manner for the injury at the very time it is committed, by affording us a just reason to blame and contemn the person who injures us. But this phenomenon likewise depends upon the same principle. For why do we blame all gross and injurious language, unless it be, because we esteem it contrary to good breeding and humanity? And why is it contrary, unless it be more shocking than any delicate satire? The rules of good breeding condemn whatever is openly disobliging, and gives a sensible pain and confusion to those with whom we converse. After this is once established, abusive language is universally blamed, and gives less pain upon account of its coarseness and incivility, which render the person despicable that employs it. It becomes less disagreeable, merely because originally it is more so; and 'tis more disagreeable, because it affords an inference by general and common rules that are palpable and undeniable.

To this explication of the different influence of open and concealed flattery or satire, I shall add the consideration of another phenomenon, which is analogous to it. There are many particulars in the point of honour, both of men and women, whose violations, when open and avowed, the world never excuses, but which it is more apt to overlook, when the appearances are

saved, and the transgression is secret and concealed. Even those who know with equal certainty that the fault is committed, pardon it more easily, when the proofs seem in some measure oblique and equivocal, than when they are direct and undeniable. The same idea is presented in both cases, and, properly speaking, is equally assented to by the judgment; and yet its influence is different, because of the different manner in which it is presented.

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Now, if we compare these two cases, of the *open* and *concealed* violations of the laws of honour, we shall find, that the difference betwixt them consists in this, that in the first case the sign, from which we infer the blameable action, is single, and suffices alone to be the foundation of our reasoning and judgment; whereas in the latter the signs are numerous, and decide little or nothing when alone and unaccompanied with many minute circumstances, which are almost imperceptible. But 'tis certainly true, that any reasoning is always the more convincing, the more single and united it is to the eye, and the less exercise it gives to the imagination to collect all its parts, and run from them to the correlative idea, which forms the conclusion. The labour of the thought disturbs the regular progress of the sentiments, as we shall observe presently. * The idea strikes not on us with such vivacity, and consequently has no such influence on the passion and imagination.

From the same principles we may account for those observations of the Cardinal de Retz, *that there are many things in which the world wishes to be deceived, and that it more easily excuses a person in acting than in talking contrary to the decorum of his profession and*

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character. A fault in words is commonly more open and distinct than one in actions, which admit of many palliating excuses, and decide not so clearly concerning the intention and views of the actor.

Thus it appears, upon the whole, that every kind of opinion or judgment which amounts not to knowledge, is derived entirely from the force and vivacity of the perception, and that these qualities constitute in the mind what we call the *belief* of the existence of any object. This force and this vivacity are most conspicuous in the memory; and therefore our confidence in the veracity of that faculty is the greatest imaginable, and equals in many respects the assurance of a demonstration. The next degree of these qualities is that derived from the relation of cause and effect; and this too is very great, especially when the conjunction is found by experience to be perfectly constant, and when the object, which is present to us, exactly resembles those, of which we have had experience. But below this degree of evidence there are many others, which have an influence on the passions and imagination, proportioned to that degree of force and vivacity, which they communicate to the ideas. 'Tis by habit we make the transition from cause to effect; and 'tis from some present impression we borrow that vivacity, which we diffuse over the correlative idea. But when we have not observed a sufficient number of instances to produce a strong habit; or when these instances are contrary to each other; or when the resemblance is not exact; or the present impression is faint and obscure; or the experience in some measure obliterated from the memory; or the connexion dependent on a long chain of objects; or the inference derived from general rules, and yet not conformable to them: in all these

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cases the evidence diminishes by the diminution of the force and intenseness of the idea. This therefore is the nature of the judgment and probability.

What principally gives authority to this system is, beside the undoubted arguments, upon which each part is founded, the agreement of these parts, and the necessity of one to explain another. The belief which attends our memory is of the same nature with that which is derived from our judgments: nor is there any difference betwixt that judgment which is derived from a constant and uniform connexion of causes and effects, and that which depends upon an interrupted and uncertain. 'Tis indeed evident, that in all determinations where the mind decides from contrary experiments, 'tis first divided within itself, and has an inclination to either side in proportion to the number of experiments we have seen and remember. This contest is at last determined to the advantage of that side where we observe a superior number of these experiments; but still with a diminution of force in the evidence correspondent to the number of the opposite experiments. Each possibility, of which the probability is composed, operates separately upon the imagination; and 'tis the larger collection of possibilities, which at last prevails, and that with a force proportionable to its superiority. All these phenomena lead directly to the precedent system; nor will it ever be possible upon any other principles to give a satisfactory and consistent explication of them. Without considering these judgments as the effects of custom on the imagination, we shall lose ourselves in perpetual contradiction and absurdity.