# SECTION 4

SBN 25

## Sceptical Doubts concerning the Operations of the Understanding

### PART 1

1 ALL the objects of human reason or enquiry may naturally be divided into two kinds, to wit, *Relations of Ideas* and *Matters of Fact*. Of the first kind are the sciences of Geometry, Algebra, and Arithmetic; and in short, every affirmation, which is either intuitively or demonstratively certain. *That the square of the hypothenuse is equal to the square of the two sides*, is a proposition, which expresses a relation between these figures. *That three times five is equal to the half of thirty*, expresses a relation between these numbers. Propositions of this kind are discoverable by the mere operation of thought, without dependence on what is any where existent in the universe. Though there never were a circle or triangle in nature, the truths, demonstrated by EUCLID, would for ever retain their certainty and evidence.

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

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3 It may, therefore, be a subject worthy of curiosity, to enquire what is the nature of that evidence, which assures us of any real existence and matter of fact, beyond the present testimony of our senses, or the records of our memory. This part of philosophy, it is observable, has been little cultivated, either by the ancients or moderns; and therefore our doubts and errors, in the prosecution of so important an enquiry, may be the more excusable; while we march through such difficult paths, without any guide or direction. They may even prove useful, by exciting curiosity, and destroying that implicit faith and security, which is the bane of all reasoning and free enquiry. The

discovery of defects in the common philosophy, if any such there be, will not, I presume, be a discouragement, but rather an incitement, as is usual, to attempt something more full and satisfactory, than has yet been proposed to the public.

4 All reasonings concerning matter of fact seem to be founded on the relation of *Cause* and *Effect*. By means of that relation alone we can go beyond the evidence of our memory and senses. If you were to ask a man, why he believes any matter of fact, which is absent; for instance, that his friend is in the country, or in FRANCE; he would give you a reason; and this reason would be some other fact; as a letter received from him, or the knowledge of his former resolutions and promises. A man, finding a watch or any other machine in a desert island, would conclude, that there had once been men in that island. All our reasonings concerning fact are of the same nature. And here it is *SBN 27* constantly supposed, that there is a connexion between the present fact and that which is inferred from it. Were there nothing to bind them together, the inference would be entirely precarious. The hearing of an articulate voice and rational discourse in the dark assures us of the presence of some person: Why? Because these are the effects of the human make and fabric, and closely connected with it. If we anatomize all the other reasonings of this nature, we shall find, that they are founded on the relation of cause and effect, and that this relation is either near or remote, direct or collateral. Heat and light are collateral effects of fire, and the one effect may justly be inferred from the other.

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

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

7 This proposition, *that causes and effects are discoverable, not by reason, but by experience*, will readily be admitted with regard to such objects, as we remember to have once been altogether unknown to us; since we must be conscious of the utter inability, which we then lay under, of foretelling, what would arise from them. Present two smooth pieces of marble to a man, who has no tincture of natural philosophy; he will never discover, that they will adhere together, in such a manner as to require great force to separate them in a direct line, while they make so small a resistance to a lateral pressure. Such events, as bear little analogy to the common course of nature, are also readily confessed to be known only by experience; nor does any man imagine that the explosion of gunpowder, or the attraction of a loadstone, could ever be discovered by arguments *a priori*. In like manner, when an effect is supposed to depend upon an intricate machinery or secret structure of parts, we make no difficulty in attributing all our knowledge of it to experience. Who will assert, that he can give the ultimate reason, why milk or bread is proper nourishment for a man, not for a lion or a tyger? *SBN 28*

8 But the same truth may not appear, at first sight, to have the same evidence with regard to events, which have become familiar to us from our first appearance in the world, which bear a close analogy to the whole course of nature, and which are supposed to depend on the simple qualities of objects, without any secret structure of parts. We are apt to imagine, that we could discover these effects by the mere operation of our reason, without experience. We fancy, that were we brought, on a sudden, into this world, we could at first have inferred, that one billiard-ball would communicate motion to another upon impulse; and that we needed not to have waited for the event, in order to pronounce with certainty concerning it. Such is the influence of custom, that, where it is strongest, it not only covers our natural ignorance, but even conceals itself, and seems not to take place, merely because it is found in the highest degree. *SBN 29*

9 But to convince us, that all the laws of nature, and all the operations of bodies without exception, are known only by experience, the following reflections may, perhaps, suffice. Were any object presented to us, and were we required to pronounce concerning the effect, which will result from it, without consulting past observation; after what manner, I beseech you, must the mind proceed in this operation? It must invent or imagine some event, which it ascribes to the object as its effect; and it is plain that this invention must be entirely arbitrary. The mind can never possibly find the effect in the supposed cause, by the most accurate scrutiny and examination. For the effect is totally different from the cause, and consequently can never be discovered in it. Motion in the second billiard-ball is a quite distinct event from

motion in the first; nor is there any thing in the one to suggest the smallest hint of the other. A stone or piece of metal raised into the air, and left without any support, immediately falls: But to consider the matter *a priori*, is there any thing we discover in this situation, which can beget the idea of a downward, rather than an upward, or any other motion, in the stone or metal?

10 And as the first imagination or invention of a particular effect, in all natural operations, is arbitrary, where we consult not experience; so must we also esteem the supposed tye or connexion between the cause and effect, which binds them together, and renders it impossible, that any other effect could result from the operation of that cause. When I see, for instance, a billiard-ball moving in a straight line towards another; even suppose motion in the second ball should by accident be suggested to me, as the result of their contact or impulse; may I not conceive, that a hundred different events might as well follow from that cause? May not both these balls remain at absolute rest? May not the first ball return in a straight line, or leap off from the second *SBN 30* in any line or direction? All these suppositions are consistent and conceivable. Why then should we give the preference to one, which is no more consistent or conceivable than the rest? All our reasonings *a priori* will never be able to show us any foundation for this preference.

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

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

ourselves sufficiently happy, if, by accurate enquiry and reasoning, we can trace up the particular phænomena to, or near to, these general principles. *SBN 31* The most perfect philosophy of the natural kind only staves off our ignorance a little longer: As perhaps the most perfect philosophy of the moral or metaphysical kind serves only to discover larger portions of our ignorance. Thus the observation of human blindness and weakness is the result of all philosophy, and meets us, at every turn, in spite of our endeavours to elude or avoid it.

13 Nor is geometry, when taken into the assistance of natural philosophy, ever able to remedy this defect, or lead us into the knowledge of ultimate causes, 10 by all that accuracy of reasoning, for which it is so justly celebrated. Every part of mixed mathematics proceeds upon the supposition, that certain laws are established by nature in her operations; and abstract reasonings are employed, either to assist experience in the discovery of these laws, or to determine their influence in particular instances, where it depends upon any precise degree of distance and quantity. Thus, it is a law of motion, discovered by experience, that the moment or force of any body in motion is in the compound ratio or proportion of its solid contents and its velocity; and consequently, that a small force may remove the greatest obstacle or raise the greatest weight, if, by any contrivance or machinery, we can encrease the 20 velocity of that force, so as to make it an overmatch for its antagonist. Geometry assists us in the application of this law, by giving us the just dimensions of all the parts and figures, which can enter into any species of machine; but still the discovery of the law itself is owing merely to experience, and all the abstract reasonings in the world could never lead us one step towards the knowledge of it. When we reason *a priori*, and consider merely any object or cause, as it appears to the mind, independent of all observation, it never could suggest to us the notion of any distinct object, such as its effect; much less, show us the inseparable and inviolable connexion between them. A man must be very sagacious, who could discover by reasoning, that crystal is the *SBN 32* effect of heat, and ice of cold, without being previously acquainted with the operations of these qualities.

## PART 2

14 But we have not, as yet, attained any tolerable satisfaction with regard to the question first proposed. Each solution still gives rise to a new question as difficult as the foregoing, and leads us on to farther enquiries. When it is asked, *What is the nature of all our reasonings concerning matter of fact?* the proper

answer seems to be, that they are founded on the relation of cause and effect. When again it is asked, *What is the foundation of all our reasonings and conclusions concerning that relation?* it may be replied in one word, EXPERIENCE. But if we still carry on our sifting humour, and ask, *What is the foundation of all conclusions from experience?* this implies a new question, which may be of more difficult solution and explication. Philosophers, that give themselves airs of superior wisdom and sufficiency, have a hard task, when they encounter persons of inquisitive dispositions, who push them from every corner, to which they retreat, and who are sure at last to bring them to some dangerous dilemma. The best expedient to prevent this confusion, is to be modest in our pretensions; and even to discover the difficulty ourselves before it is objected to us. By this means, we may make a kind of merit of our very ignorance.

I shall content myself, in this section, with an easy task, and shall pretend only to give a negative answer to the question here proposed. I say then, that, even after we have experience of the operations of cause and effect, our conclusions from that experience are *not* founded on reasoning, or any process of the understanding. This answer we must endeavour, both to explain and to defend.

16 It must certainly be allowed, that nature has kept us at a great distance from all her secrets, and has afforded us only the knowledge of a few superficial qualities of objects; while she conceals from us those powers and principles, on which the influence of these objects entirely depends. Our senses inform us of the colour, weight, and consistence of bread; but neither sense nor reason can ever inform us of those qualities, which fit it for the nourishment and support of a human body. Sight or feeling conveys an idea of the actual motion of bodies; but as to that wonderful force or power, which would carry on a moving body for ever in a continued change of place, and which bodies never lose but by communicating it to others; of this we cannot form the most distant conception. But notwithstanding this ignorance of natural powers[7] and principles, we always presume, when we see like sensible qualities, that they have like secret powers, and expect, that effects, similar to those, which we have experienced, will follow from them. If a body of like colour and consistence with that bread, which we have formerly eat, be presented to us, we make no scruple of repeating the experiment, and foresee, with certainty, like nourishment and support. Now this is a process of the mind or thought, of which I would willingly know the foundation. It is

*SBN 33*

[7] The word, *power*, is here used in a loose and popular sense. The more accurate explication of it would give additional evidence to this argument. See Section 7.

*SBN 33*

allowed on all hands, that there is no known connexion between the sensible qualities and the secret powers; and consequently, that the mind is not led to form such a conclusion concerning their constant and regular conjunction, by any thing which it knows of their nature. As to past *Experience*, it can be allowed to give *direct* and *certain* information of those precise objects only, and that precise period of time, which fell under its cognizance: But why this experience should be extended to future times, and to other objects, which, for aught we know, may be only in appearance similar; this is the main question on which I would insist. The bread, which I formerly eat, nourished me; *SBN 34*
that is, a body of such sensible qualities, was, at that time, endowed with such
secret powers: But does it follow, that other bread must also nourish me at another time, and that like sensible qualities must always be attended with like secret powers? The consequence seems nowise necessary. At least, it must be acknowledged, that there is here a consequence drawn by the mind; that there is a certain step taken; a process of thought, and an inference, which wants to be explained. These two propositions are far from being the same, *I have found that such an object has always been attended with such an effect*, and *I foresee, that other objects, which are, in appearance, similar, will be attended with similar effects*. I shall allow, if you please, that the one proposition may justly be inferred from the other: I know in fact, that it always is
inferred. But if you insist, that the inference is made by a chain of reasoning, I desire you to produce that reasoning. The connexion between these propositions is not intuitive. There is required a medium, which may enable the mind to draw such an inference, if indeed it be drawn by reasoning and argument. What that medium is, I must confess, passes my comprehension; and it is incumbent on those to produce it, who assert, that it really exists, and is the origin of all our conclusions concerning matter of fact.

17 This negative argument must certainly, in process of time, become altogether convincing, if many penetrating and able philosophers shall turn their enquiries this way; and no one be ever able to discover any connecting proposition or intermediate step, which supports the understanding in this conclusion. But as the question is yet new, every reader may not trust so far to his own penetration, as to conclude, because an argument escapes his enquiry, that therefore it does not really exist. For this reason it may be requisite to *SBN 35*
venture upon a more difficult task; and enumerating all the branches of human knowledge, endeavour to show, that none of them can afford such an argument.

18 All reasonings may be divided into two kinds, namely, demonstrative reasoning, or that concerning relations of ideas, and moral reasoning, or that concerning matter of fact and existence. That there are no demonstrative

arguments in the case, seems evident; since it implies no contradiction, that the course of nature may change, and that an object, seemingly like those which we have experienced, may be attended with different or contrary effects. May I not clearly and distinctly conceive, that a body, falling from the clouds, and which, in all other respects, resembles snow, has yet the taste of salt or feeling of fire? Is there any more intelligible proposition than to affirm, that all the trees will flourish in DECEMBER and JANUARY, and decay in MAY and JUNE? Now whatever is intelligible, and can be distinctly conceived, implies no contradiction, and can never be proved false by any demonstrative argument or abstract reasoning *a priori*.

19 If we be, therefore, engaged by arguments to put trust in past experience, and make it the standard of our future judgment, these arguments must be probable only, or such as regard matter of fact and real existence, according to the division above-mentioned. But that there is no argument of this kind, must appear, if our explication of that species of reasoning be admitted as solid and satisfactory. We have said, that all arguments concerning existence are founded on the relation of cause and effect; that our knowledge of that relation is derived entirely from experience; and that all our experimental conclusions proceed upon the supposition, that the future will be conformable to the past. To endeavour, therefore, the proof of this last supposition by probable arguments, or arguments regarding existence, must be *SBN 36* evidently going in a circle, and taking that for granted, which is the very point in question.

20 In reality, all arguments from experience are founded on the similarity, which we discover among natural objects, and by which we are induced to expect effects similar to those, which we have found to follow from such objects. And though none but a fool or madman will ever pretend to dispute the authority of experience, or to reject that great guide of human life; it may surely be allowed a philosopher to have so much curiosity at least, as to examine the principle of human nature, which gives this mighty authority to experience, and makes us draw advantage from that similarity, which nature has placed among different objects. From causes, which appear *similar*, we expect similar effects. This is the sum of all our experimental conclusions. Now it seems evident, that, if this conclusion were formed by reason, it would be as perfect at first, and upon one instance, as after ever so long a course of experience. But the case is far otherwise. Nothing so like as eggs; yet no one, on account of this appearing similarity, expects the same taste and relish in all of them. It is only after a long course of uniform experiments in any kind, that we attain a firm reliance and security with regard to a particular event. Now where is that process of reasoning, which, from one instance,

draws a conclusion, so different from that which it infers from a hundred instances, that are nowise different from that single one? This question I propose as much for the sake of information, as with an intention of raising difficulties. I cannot find, I cannot imagine any such reasoning. But I keep my mind still open to instruction, if any one will vouchsafe to bestow it on me.

21 Should it be said, that, from a number of uniform experiments, we *infer* a connexion between the sensible qualities and the secret powers; this, I must confess, seems the same difficulty, couched in different terms. The question *SBN 37* still recurs, On what process of argument this *inference* is founded? Where is the medium, the interposing ideas, which join propositions so very wide of 10 each other? It is confessed, that the colour, consistence, and other sensible qualities of bread appear not, of themselves, to have any connexion with the secret powers of nourishment and support. For otherwise we could infer these secret powers from the first appearance of these sensible qualities, without the aid of experience; contrary to the sentiment of all philosophers, and contrary to plain matter of fact. Here then is our natural state of ignorance with regard to the powers and influence of all objects. How is this remedied by experience? It only shows us a number of uniform effects, resulting from certain objects, and teaches us, that those particular objects, at that particular time, were endowed with such powers and forces. When a new object, 20 endowed with similar sensible qualities, is produced, we expect similar powers and forces, and look for a like effect. From a body of like colour and consistence with bread, we expect like nourishment and support. But this surely is a step or progress of the mind, which wants to be explained. When a man says, *I have found, in all past instances, such sensible qualities conjoined with such secret powers*: And when he says, *similar sensible qualities will always be conjoined with similar secret powers*; he is not guilty of a tautology, nor are these propositions in any respect the same. You say that the one proposition is an inference from the other. But you must confess, that the inference is not intuitive; neither is it demonstrative: Of what nature is it then? To say it is 30 experimental, is begging the question. For all inferences from experience suppose, as their foundation, that the future will resemble the past, and that similar powers will be conjoined with similar sensible qualities. If there be any suspicion, that the course of nature may change, and that the past may be *SBN 38* no rule for the future, all experience becomes useless, and can give rise to no inference or conclusion. It is impossible, therefore, that any arguments from experience can prove this resemblance of the past to the future; since all these arguments are founded on the supposition of that resemblance. Let the course of things be allowed hitherto ever so regular; that alone, without some new argument or inference, proves not, that, for the future, it will continue 40

so. In vain do you pretend to have learned the nature of bodies from your past experience. Their secret nature, and consequently, all their effects and influence, may change, without any change in their sensible qualities. This happens sometimes, and with regard to some objects: Why may it not happen always, and with regard to all objects? What logic, what process of argument secures you against this supposition? My practice, you say, refutes my doubts. But you mistake the purport of my question. As an agent, I am quite satisfied in the point; but as a philosopher, who has some share of curiosity, I will not say scepticism, I want to learn the foundation of this inference. No reading, no enquiry has yet been able to remove my difficulty, or give me satisfaction in a matter of such importance. Can I do better than propose the difficulty to the public, even though, perhaps, I have small hopes of obtaining a solution? We shall at least, by this means, be sensible of our ignorance, if we do not augment our knowledge.

22 I must confess, that a man is guilty of unpardonable arrogance, who concludes, because an argument has escaped his own investigation, that therefore it does not really exist. I must also confess, that, though all the learned, for several ages, should have employed themselves in fruitless search upon any subject, it may still, perhaps, be rash to conclude positively, that the subject must, therefore, pass all human comprehension. Even though we examine all the sources of our knowledge, and conclude them unfit for such a subject, there may still remain a suspicion, that the enumeration is not compleat, or the examination not accurate. But with regard to the present subject, there are some considerations, which seem to remove all this accusation of arrogance or suspicion of mistake. *SBN 39*

23 It is certain, that the most ignorant and stupid peasants, nay infants, nay even brute beasts, improve by experience, and learn the qualities of natural objects, by observing the effects, which result from them. When a child has felt the sensation of pain from touching the flame of a candle, he will be careful not to put his hand near any candle; but will expect a similar effect from a cause, which is similar in its sensible qualities and appearance. If you assert, therefore, that the understanding of the child is led into this conclusion by any process of argument or ratiocination, I may justly require you to produce that argument; nor have you any pretence to refuse so equitable a demand. You cannot say, that the argument is abstruse, and may possibly escape your enquiry; since you confess, that it is obvious to the capacity of a mere infant. If you hesitate, therefore, a moment, or if, after reflection, you produce any intricate or profound argument, you, in a manner, give up the question, and confess, that it is not reasoning which engages us to suppose the past resembling the future, and to expect similar effects from causes,

which are, to appearance, similar. This is the proposition which I intended to enforce in the present section. If I be right, I pretend not to have made any mighty discovery. And if I be wrong, I must acknowledge myself to be indeed a very backward scholar; since I cannot now discover an argument, which, it seems, was perfectly familiar to me, long before I was out of my cradle.

# SECTION 5

*SBN 40*

## Sceptical Solution of these Doubts

### PART 1

1 THE passion for philosophy, like that for religion, seems liable to this inconvenience, that, though it aims at the correction of our manners, and extirpation of our vices, it may only serve, by imprudent management, to foster a predominant inclination, and push the mind, with more determined resolution, towards that side, which already *draws* too much, by the biass and propensity of the natural temper. It is certain, that, while we aspire to the magnanimous firmness of the philosophic sage, and endeavour to confine our pleasures altogether within our own minds, we may, at last, render our philosophy like that of EPICTETUS, and other STOICS, only a more refined system of selfishness, and reason ourselves out of all virtue, as well as social enjoyment. While we study with attention the vanity of human life, and turn all our thoughts towards the empty and transitory nature of riches and honours, we are, perhaps, all the while, flattering our natural indolence, which, hating the bustle of the world, and drudgery of business, seeks a pretence of reason, to give itself a full and uncontrouled indulgence. There is, however, one species of philosophy, which seems little liable to this inconvenience, and that because it strikes in with no disorderly passion of the human mind, nor can mingle itself with any natural affection or propensity; and that is the ACADEMIC or SCEPTICAL philosophy. The ACADEMICS always talk of doubt and suspence of judgment, of danger in hasty determinations, of confining to very narrow bounds the enquiries of the understanding, and of renouncing all speculations which lie not within the limits of common life and practice. Nothing, therefore, can be more contrary than such a philosophy to the supine indolence of the mind, its rash arrogance, its lofty pretensions, and its superstitious credulity. Every passion is mortified by it, except the love of truth; and that passion never is, nor can be carried to too high a degree. It is surprizing, therefore, that this philosophy, which, in almost every instance, must be harmless and innocent, should be the subject of so much groundless reproach and obloquy. But, perhaps, the very circumstance, which renders it so innocent, is what chiefly exposes it to the public hatred and resentment. By flattering no irregular passion, it gains few partizans: By opposing so many

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vices and follies, it raises to itself abundance of enemies, who stigmatize it as libertine, profane, and irreligious.

2 Nor need we fear, that this philosophy, while it endeavours to limit our enquiries to common life, should ever undermine the reasonings of common life, and carry its doubts so far as to destroy all action, as well as speculation. Nature will always maintain her rights, and prevail in the end over any abstract reasoning whatsoever. Though we should conclude, for instance, as in the foregoing section, that, in all reasonings from experience, there is a step taken by the mind, which is not supported by any argument or process of the understanding; there is no danger, that these reasonings, on which almost all knowledge depends, will ever be affected by such a discovery. If the mind be not engaged by argument to make this step, it must be induced by some other principle of equal weight and authority; and that principle will preserve its influence as long as human nature remains the same. What that principle is, may well be worth the pains of enquiry. *SBN 42*

3 Suppose a person, though endowed with the strongest faculties of reason and reflection, to be brought on a sudden into this world; he would, indeed, immediately observe a continual succession of objects, and one event following another; but he would not be able to discover any thing farther. He would not, at first, by any reasoning, be able to reach the idea of cause and effect; since the particular powers, by which all natural operations are performed, never appear to the senses; nor is it reasonable to conclude, merely because one event, in one instance, precedes another, that therefore the one is the cause, the other the effect. Their conjunction may be arbitrary and casual. There may be no reason to infer the existence of one from the appearance of the other. And in a word, such a person, without more experience, could never employ his conjecture or reasoning concerning any matter of fact, or be assured of any thing beyond what was immediately present to his memory and senses.

4 Suppose again, that he has acquired more experience, and has lived so long in the world as to have observed similar objects or events to be constantly conjoined together; what is the consequence of this experience? He immediately infers the existence of one object from the appearance of the other. Yet he has not, by all his experience, acquired any idea or knowledge of the secret power, by which the one object produces the other; nor is it, by any process of reasoning, he is engaged to draw this inference. But still he finds himself determined to draw it: And though he should be convinced, that his understanding has no part in the operation, he would nevertheless continue in the same course of thinking. There is some other principle, which determines him to form such a conclusion.

This principle is CUSTOM or HABIT. For wherever the repetition of any *SBN 43*
particular act or operation produces a propensity to renew the same act or operation, without being impelled by any reasoning or process of the understanding; we always say, that this propensity is the effect of *Custom*. By employing that word, we pretend not to have given the ultimate reason of such a propensity. We only point out a principle of human nature, which is universally acknowledged, and which is well known by its effects. Perhaps, we can push our enquiries no farther, or pretend to give the cause of this cause; but must rest contented with it as the ultimate principle, which we can assign, of all our conclusions from experience. It is sufficient satisfaction, that we can go so far; without repining at the narrowness of our faculties, because they will carry us no farther. And it is certain we here advance a very intelligible proposition at least, if not a true one, when we assert, that, after the constant conjunction of two objects, heat and flame, for instance, weight and solidity, we are determined by custom alone to expect the one from the appearance of the other. This hypothesis seems even the only one, which explains the difficulty, why we draw, from a thousand instances, an inference, which we are not able to draw from one instance, that is, in no respect, different from them. Reason is incapable of any such variation. The conclusions, which it draws from considering one circle, are the same which it would form upon surveying all the circles in the universe. But no man, having seen only one body move after being impelled by another, could infer, that every other body will move after a like impulse. All inferences from experience, therefore, are effects of custom, not of reasoning.[8]

[8] Nothing is more usual than for writers, even on *moral*, *political*, or *physical* subjects, to distin- *SBN 43*
guish between *reason* and *experience*, and to suppose, that these species of argumentation are entirely different from each other. The former are taken for the mere result of our intellectual faculties, *SBN 44*
which, by considering *a priori* the nature of things, and examining the effects, that must follow from their operation, establish particular principles of science and philosophy. The latter are supposed to be derived entirely from sense and observation, by which we learn what has actually resulted from the operation of particular objects, and are thence able to infer, what will, for the future, result from them. Thus, for instance, the limitations and restraints of civil government, and a legal constitution, may be defended, either from *reason*, which, reflecting on the great frailty and corruption of human nature, teaches, that no man can safely be trusted with unlimited authority; or from *experience* and history, which inform us of the enormous abuses, that ambition, in every age and country, has been found to make of so imprudent a confidence.

The same distinction between reason and experience is maintained in all our deliberations concerning the conduct of life; while the experienced statesman, general, physician, or merchant is trusted and followed; and the unpractised novice, with whatever natural talents endowed, neglected, and despised. Though it be allowed, that reason may form very plausible conjectures with regard to the consequences of such a particular conduct in such particular circumstances; it is still supposed imperfect, without the assistance of experience, which is alone able to give stability and certainty to the maxims, derived from study and reflection.

But notwithstanding that this distinction be thus universally received, both in the active and speculative scenes of life, I shall not scruple to pronounce, that it is, at bottom, erroneous, or at least, superficial.

If we examine those arguments, which, in any of the sciences above-mentioned, are supposed to

6 Custom, then, is the great guide of human life. It is that principle alone, *SBN 44*
which renders our experience useful to us, and makes us expect, for the future, a similar train of events with those which have appeared in the past. Without the influence of custom, we should be entirely ignorant of every *SBN 45*
matter of fact, beyond what is immediately present to the memory and senses. We should never know how to adjust means to ends, or to employ our natural powers in the production of any effect. There would be an end at once of all action, as well as of the chief part of speculation.

7 But here it may be proper to remark, that though our conclusions from experience carry us beyond our memory and senses, and assure us of matters of fact, which happened in the most distant places and most remote ages; yet some fact must always be present to the senses or memory, from which we may first proceed in drawing these conclusions. A man, who should find in a desert country the remains of pompous buildings, would conclude, that the country had, in ancient times, been cultivated by civilized inhabitants; but did nothing of this nature occur to him, he could never form such an infer- *SBN 46*
ence. We learn the events of former ages from history; but then we must peruse the volumes, in which this instruction is contained, and thence carry up our inferences from one testimony to another, till we arrive at the eye-witnesses and spectators of these distant events. In a word, if we proceed not upon some fact, present to the memory or senses, our reasonings would be merely hypothetical; and however the particular links might be connected

be the mere effects of reasoning and reflection, they will be found to terminate, at last, in some general principle or conclusion, for which we can assign no reason but observation and experience. The only difference between them and those maxims, which are vulgarly esteemed the result of pure experience, is, that the former cannot be established without some process of thought, and some reflection on what we have observed, in order to distinguish its circumstances, and trace its consequences: Whereas in the latter, the experienced event is exactly and fully similar to that which we infer as the result of any particular situation. The history of a Tiberius or a Nero makes us dread a like tyranny, were our monarchs freed from the restraints of laws and senates: But the observation of any fraud or cruelty in private life is sufficient, with the aid of a little thought, to give us the same *SBN 45*
apprehension; while it serves as an instance of the general corruption of human nature, and shows us the danger which we must incur by reposing an entire confidence in mankind. In both cases, it is experience which is ultimately the foundation of our inference and conclusion.

There is no man so young and unexperienced, as not to have formed, from observation, many general and just maxims concerning human affairs and the conduct of life; but it must be confessed, that, when a man comes to put these in practice, he will be extremely liable to error, till time and farther experience both enlarge these maxims, and teach him their proper use and application. In every situation or incident, there are many particular and seemingly minute circumstances, which the man of greatest talents is, at first, apt to overlook, though on them the justness of his conclusions, and consequently the prudence of his conduct, entirely depend. Not to mention, that, to a young beginner, the general observations and maxims occur not always on the proper occasions, nor can be immediately applied with due calmness and distinction. The truth is, an unexperienced reasoner could be no reasoner at all, were he absolutely unexperienced; and when we assign that character to any one, we mean it only in a comparative sense, and suppose him possessed of experience, in a smaller and more imperfect degree.

with each other, the whole chain of inferences would have nothing to support it, nor could we ever, by its means, arrive at the knowledge of any real existence. If I ask, why you believe any particular matter of fact, which you relate, you must tell me some reason; and this reason will be some other fact, connected with it. But as you cannot proceed after this manner, *in infinitum*, you must at last terminate in some fact, which is present to your memory or senses; or must allow that your belief is entirely without foundation.

8 What then is the conclusion of the whole matter? A simple one; though, it must be confessed, pretty remote from the common theories of philosophy. All belief of matter of fact or real existence is derived merely from some object, present to the memory or senses, and a customary conjunction between that and some other object. Or in other words; having found, in many instances, that any two kinds of objects, flame and heat, snow and cold, have always been conjoined together; if flame or snow be presented anew to the senses, the mind is carried by custom to expect heat or cold, and to *believe*, that such a quality does exist, and will discover itself upon a nearer approach. This belief is the necessary result of placing the mind in such circumstances. It is an operation of the soul, when we are so situated, as unavoidable as to feel the passion of love, when we receive benefits; or hatred, when we meet with injuries. All these operations are a species of natural instincts, which no reasoning or process of the thought and understanding is able, either to produce, or to prevent. *SBN 47*

9 At this point, it would be very allowable for us to stop our philosophical researches. In most questions, we can never make a single step farther; and in all questions, we must terminate here at last, after our most restless and curious enquiries. But still our curiosity will be pardonable, perhaps commendable, if it carry us on to still farther researches, and make us examine more accurately the nature of this *belief*, and of the *customary conjunction*, whence it is derived. By this means we may meet with some explications and analogies, that will give satisfaction; at least to such as love the abstract sciences, and can be entertained with speculations, which, however accurate, may still retain a degree of doubt and uncertainty. As to readers of a different taste; the remaining part of this section is not calculated for them, and the following enquiries may well be understood, though it be neglected.

## PART 2

10 Nothing is more free than the imagination of man; and though it cannot exceed that original stock of ideas, furnished by the internal and external senses, it has unlimited power of mixing, compounding, separating, and

dividing these ideas, in all the varieties of fiction and vision. It can feign a train of events, with all the appearance of reality, ascribe to them a particular time and place, conceive them as existent, and paint them out to itself with every circumstance, that belongs to any historical fact, which it believes with the greatest certainty. Wherein, therefore, consists the difference between such a fiction and belief? It lies not merely in any peculiar idea, which is annexed to such a conception as commands our assent, and which is wanting to every known fiction. For as the mind has authority over all its *SBN 48*
ideas, it could voluntarily annex this particular idea to any fiction, and consequently be able to believe whatever it pleases; contrary to what we find by 10
daily experience. We can, in our conception, join the head of a man to the body of a horse; but it is not in our power to believe, that such an animal has ever really existed.

11 It follows, therefore, that the difference between *fiction* and *belief* lies in some sentiment or feeling, which is annexed to the latter, not to the former, and which depends not on the will, nor can be commanded at pleasure. It must be excited by nature, like all other sentiments; and must arise from the particular situation, in which the mind is placed at any particular juncture. Whenever any object is presented to the memory or senses, it immediately, by the force of custom, carries the imagination to conceive that 20
object, which is usually conjoined to it; and this conception is attended with a feeling or sentiment, different from the loose reveries of the fancy. In this consists the whole nature of belief. For as there is no matter of fact which we believe so firmly, that we cannot conceive the contrary, there would be no difference between the conception assented to, and that which is rejected, were it not for some sentiment, which distinguishes the one from the other. If I see a billiard-ball moving towards another, on a smooth table, I can easily conceive it to stop upon contact. This conception implies no contradiction; but still it feels very differently from that conception, by which I represent to myself the impulse, and the communication of motion from one ball to 30
another.

12 Were we to attempt a *definition* of this sentiment, we should, perhaps, find it a very difficult, if not an impossible task; in the same manner as if we should endeavour to define the feeling of cold or passion of anger, to a creature who never had any experience of these sentiments. *Belief* is the true and *SBN 49*
proper name of this feeling; and no one is ever at a loss to know the meaning of that term; because every man is every moment conscious of the sentiment represented by it. It may not, however, be improper to attempt a *description* of this sentiment; in hopes we may, by that means, arrive at some analogies, which may afford a more perfect explication of it. I say then, that belief 40

is nothing but a more vivid, lively, forcible, firm, steady conception of an object, than what the imagination alone is ever able to attain. This variety of terms, which may seem so unphilosophical, is intended only to express that act of the mind, which renders realities, or what is taken for such, 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, it is 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 fictitious 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 this faculty of imagination can ever, of itself, reach belief, it is evident, that belief consists not in the peculiar nature or order of ideas, but in the *manner* of their conception, and in their *feeling* to the mind. I confess, that it is impossible perfectly to explain this feeling or manner of conception. We may make use of words, which express something near it. But its true and proper name, as we observed before, 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 *belief* is something felt by the mind, which distinguishes the ideas of the judgment from the fictions of the imagination. It gives them more weight and influence; makes them appear of *SBN 50* greater importance; enforces them in the mind; and renders them the governing principle of our actions. I hear at present, for instance, a person's voice, with whom I am acquainted; and the sound comes as from the next room. This impression of my senses immediately conveys my thought to the person, together with all the surrounding objects. I paint them out to myself as existing at present, with the same qualities and relations, of which I formerly knew them possessed. These ideas take faster hold of my mind, than ideas of an enchanted castle. They are very different to the feeling, and have a much greater influence of every kind, either to give pleasure or pain, joy or sorrow.

13 Let us, then, take in the whole compass of this doctrine, and allow, that the sentiment of belief is nothing but a conception more intense and steady than what attends the mere fictions of the imagination, and that this *manner* of conception arises from a customary conjunction of the object with something present to the memory or senses: I believe that it will not be difficult, upon these suppositions, to find other operations of the mind analogous to it, and to trace up these phænomena to principles still more general.

14 We have already observed, that nature has established connexions among particular ideas, and that no sooner one idea occurs to our thoughts than it

introduces its correlative, and carries our attention towards it, by a gentle and insensible movement. These principles of connexion or association we have reduced to three, namely, *Resemblance*, *Contiguity*, and *Causation*; which are the only bonds, that unite our thoughts together, and beget that regular train of reflection or discourse, which, in a greater or less degree, takes place among all mankind. Now here arises a question, on which the solution of the present difficulty will depend. Does it happen, in all these relations, that, when one of the objects is presented to the senses or memory, the mind is not *SBN 51*
only carried to the conception of the correlative, but reaches a steadier and stronger conception of it than what otherwise it would have been able to attain? This seems to be the case with that belief, which arises from the relation of cause and effect. And if the case be the same with the other relations or principles of association, this may be established as a general law, which takes place in all the operations of the mind.

15 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 it is set before us; but when it is removed, rather choose to consider him directly, than by reflection in an image, which is equally distant and obscure.

16 The ceremonies of the Roman Catholic religion may be considered as instances of the same nature. The devotees of that superstition usually plead in excuse for 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, if directed entirely to distant and immaterial objects. We shadow out the objects of our faith, say they, in sensible types and images, and *SBN 52*
render them more present to us by the immediate presence of these types, than it is 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 ideas 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.

17 We may add force to these experiments by others of a different kind, in considering the effects of *contiguity* as well as of *resemblance*. It is 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, which imitates an immediate impression. The thinking on any object readily transports the mind to what is contiguous; but it is 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 or 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 between them; that transition alone is not able to give a superior vivacity to any of the ideas, for want of some immediate impression.[9]

18 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 relicts of saints and holy men, for the same reason, that they seek after types or 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 it is evident, that one of the best relicts, which a devotee could procure, would be the handywork of a saint; and if his cloaths and furniture are ever to be considered in this light, it is because they were once at his disposal, and were moved and affected by him; in which respect they are to be considered as imperfect effects, and as connected with him by a shorter chain of consequences than any of those, by which we learn the reality of his existence. *SBN 53*

19 Suppose, that the son of a friend, who had been long dead or absent, were presented to us; it is evident, that this object would instantly revive its correlative idea, and recall to our thoughts all past intimacies and familiarities, in more lively colours than they would otherwise have appeared to us. This

[9] "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 accepimus primum hic disputare solitum: Cujus etiam illi hortuli propinqui non memoriam solum mihi afferunt, sed ipsum videntur in conspectu meo hic ponere. Hic Speusippus, hic Xenocrates, hic ejus auditor Polemo; cujus ipsa illa sessio fuit, quam videmus. Equidem etiam curiam nostram, Hostiliam dico, non hanc novam, quae 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 memoriae ducta sit disciplina." Cicero, de finibus. lib. 5. *SBN 52* *SBN 53*

is another phænomenon, which seems to prove the principle above-mentioned.

20 We may observe, that, in these phænomena, the belief of the correlative object is always presupposed; without which the relation could have no effect. The influence of the picture supposes, that we *believe* our friend to have once existed. Contiguity to home can never excite our ideas of home, *SBN 54* unless we *believe* that it really exists. Now I assert, that this belief, where it reaches beyond the memory or senses, is of a similar nature, and arises from similar causes, with the transition of thought and vivacity of conception here explained. When I throw a piece of dry wood into a fire, my mind is immedi- 10 ately carried to conceive, that it augments, not extinguishes the flame. This transition of thought from the cause to the effect proceeds not from reason. It derives its origin altogether from custom and experience. And as it first begins from an object, present to the senses, it renders the idea or conception of flame more strong and lively than any loose, floating reverie of the imagination. That idea arises immediately. The thought moves instantly towards it, and conveys to it all that force of conception, which is derived from the impression present to the senses. When a sword is levelled at my breast, does not the idea of wound and pain strike me more strongly, than when a glass of wine is presented to me, even though by accident this idea should 20 occur after the appearance of the latter object? But what is there in this whole matter to cause such a strong conception, except only a present object and a customary transition to the idea of another object, which we have been accustomed to conjoin with the former? This is the whole operation of the mind, in all our conclusions concerning matter of fact and existence; and it is a satisfaction to find some analogies, by which it may be explained. The transition from a present object does in all cases give strength and solidity to the related idea.

21 Here, then, is a kind of pre-established harmony between the course of nature and the succession of our ideas; and though the powers and forces, by 30 which the former is governed, be wholly unknown to us; yet our thoughts and conceptions have still, we find, gone on in the same train with the other works *SBN 55* of nature. Custom is that principle, by which this correspondence has been effected; so necessary to the subsistence of our species, and the regulation of our conduct, in every circumstance and occurrence of human life. Had not the presence of an object instantly excited the idea of those objects, commonly conjoined with it, all our knowledge must have been limited to the narrow sphere of our memory and senses; and we should never have been able to adjust means to ends, or employ our natural powers, either to the producing of good, or avoiding of evil. Those, who delight in the discovery and 40

contemplation of *final causes*, have here ample subject to employ their wonder and admiration.

22 I shall add, for a further confirmation of the foregoing theory, that, as this operation of the mind, by which we infer like effects from like causes, and *vice versa*, is so essential to the subsistence of all human creatures, it is not probable, that it could be trusted to the fallacious deductions of our reason, which is slow in its operations; appears not, in any degree, during the first years of infancy; and at best is, in every age and period of human life, extremely liable to error and mistake. It is more conformable to the ordinary wisdom of nature to secure so necessary an act of the mind, by some instinct or me- 10
chanical tendency, which may be infallible in its operations, may discover itself at the first appearance of life and thought, and may be independent of all the laboured deductions of the understanding. As nature has taught us the use of our limbs, without giving us the knowledge of the muscles and nerves, by which they are actuated; so has she implanted in us an instinct, which carries forward the thought in a correspondent course to that which she has established among external objects; though we are ignorant of those powers and forces, on which this regular course and succession of objects totally depends.

## SECTION 4

**SECTION 4]** This section shows similarities to *THN* 1.3.1, 6; see also *Abstract*, *passim*.

24.2 ***Relations of Ideas* and *Matters of Fact*]** Similarities to Hume's distinction between these two objects of reason and inquiry are apparent in the distinction in Malebranche[B] between (1) relations between ideas, (2) relations between things, and (3) relations between ideas and things (*Search after Truth* 6.1.5). The first falls into the category of necessary truths, whereas the second and third fall into the category of contingent truths. See related distinctions in Arnauld[B] and Nicole,[B] *Logic or the Art of Thinking*, fourth part, ch. 13 (Buroker, 263–5); Locke[B] on certainty, intuition, and demonstration (see ann. 32.30); and the criticisms of Malebranche in French philosopher Simon Foucher (1644–96), *Critique of the Search for the Truth* (Watson and Grene, 21–4, 30–1). See *THN* 1.3.1 for Hume's earlier treatment of this distinction.

24.3 **Geometry, Algebra, and Arithmetic]** Hume and Malebranche[B] (*Search after Truth* 6.1.5) both list geometry, algebra, and arithmetic as exemplars of relations of ideas and the demonstrative sciences. Hume's inclusion of geometry does

not follow the precedent in *THN* (see 1.3.1.4; cf. 1.4.1). Compare parallels in Locke,[B] *Essay* 4.1.1–5, 4.2.1, 4.4.18.

24.9 **never were a circle]** Compare Locke,[B] *Essay* 3.3.19, 4.4.8.

24.10 **Euclid[B]]** See ann. 49.28.

24.15 **imply a contradiction]** For discussions of this criterion, see *Dialogues* 9.5; and *Abstract* 11, 18. See also Glanvill, *Scepsis scientifica* 23 (144); and John Wilkins, *Of the Principles and Duties of Natural Religion* 1.3.4 (cf. 1.1.3).

24.17 ***sun will not rise to-morrow***] See ann. n. 10; *THN* 1.3.11.2; and *Letter from a Gentleman* 26. This example of the sun, and observations similar to Hume's, are found in English philosopher William Wollaston (1659–1724), *Religion of Nature Delineated* 3.16 (57). The example was widely used in discussions of probability, evidence, and proof. See Hobbes, *Elements of Philosophy . . . concerning Body* 10.5 (*Works*, 1: 129–31), and *Questions concerning Liberty, Necessity, and Chance* 14 (5: 150–1); Butler, *Analogy*, introduction; John Wilkins, *Of the Principles and Duties of Natural Religion* 1.3.4; Dutch mathematician and philosopher W. James s' Gravesande (1688–1742), *Mathematical Elements of Natural Philosophy*, 'An Oration concerning Evidence', especially 1: xxxvi.

24.25 **little cultivated, either by the ancients or moderns]** To say 'little cultivated' is not to say there were no predecessors. Among the ancients Sextus Empiricus (*Outlines of Pyrrhonism* 2.204–8 (ch. 15)) rejects induction on grounds that particulars omitted in the induction may invalidate the universal. Among modern philosophers questions about evidence had been prominently discussed by Descartes[B] (*Meditations*) and Locke[B] (*Essay*); a clear statement about the nature of evidence is found in W. James s' Gravesande, 'An Oration concerning Evidence', in *Mathematical Elements of Natural Philosophy*.

24.29 **implicit faith]** An implicit faith is a belief based on the judgement or authority of faculties, sentiments, or parties that one deeply trusts. For other uses of 'implicit faith' in Hume's writings, see *Letters*, 1: 473 (to Gilbert Elliot of Minto); *History of England*, vol. 1, ch. 4, and vol. 4, ch. 40; *THN* 1.4.2.56; *NHR* 12.15; 'Of Parties in General' 13; and 'Of National Characters', n. 2. For philosophical and theological uses of the notion, see Hobbes, *Leviathan* 32.2, and *An Answer to Dr. Bramhall*, *Works*, 4: 382; Locke,[B] *Essay* 1.4.22, 2.33.17, 4.12.6, 4.17.4; Leibniz,[B] *New Essays* (pub. 1765) 4.17.4, 4.20.18; French counsellor and philosopher François de la Mothe Le Vayer (1588–1669), *De la vertu des payens*, 'De Pyrrhon' (298); Berkeley,[B] *Alciphron*, dialogue 6.18, 32; and Chambers, *Cyclopædia*, 'faith'. See also George Campbell's use (in commenting on Hume) in *A Dissertation on Miracles*, 77.

25.5 **All reasonings]** The nature of reasoning—here connected to the earlier account of ideas and their relations—is likely informed in this section by the treatment of reasoning in Locke,[B] Descartes,[B] and Arnauld[B] and Nicole.[B] See also ann. 32.30 on intuition and demonstration and the discussion of probability in ann. Section 6.

25.33 **examination of its sensible qualities]** Several of Hume's predecessors had observed that causality is unperceivable, that it is known only by repetition in experience, or that necessary connections are not present in sensory experience. See Glanvill, *Scepsis scientifica* 23 (142), 25 (154), and *Essays*, 'Against Confidence in Philosophy', 16 ff.; Berkeley,[B] *Principles* 1.32, 103, and *Three Dialogues*, dials. 1–2; English natural philosopher Robert Boyle (1627–91), *The Christian Virtuoso* (*Works*, 5: 526–8).

25.34 **Adam]** Compare discussions of Adam or similar 'persons' in *Abstract* 11–14; *DIS* 2.47; *NHR* 1.6; and *THN* 2.1.6.9.

26.5 **pieces of marble]** This example of two smooth pieces of marble was widely mentioned as an instance of adherence—also called 'cohesion' at *EHU* 4.12. Hume uses the same example in *THN* 2.3.1.8. Boyle dealt theoretically and mechanically with the phenomenon of cohesion in two smooth bodies of marble (*New Experiments Physico-Mechanical, touching the Spring of the Air*, which gives a reference to *The History of Fluidity and Firmness*—both in *Works*, 1: 1–117, 377–442); *New Experiments* is one of the few works by Boyle found in the Hume Library. See also Hume's tribute to Boyle in *History of England*, ch. 71 (6: 541).) Locke[B] used the example several times (*Essay* 2.4.4–5, 2.23.23–4). It is also mentioned by Hobbes, *Seven Philosophical Problems* 3; and Italian natural philosopher Galileo Galilei (1564–1642), *Two New Sciences*, 19–20.

26.6 **natural philosophy]** 'Natural philosophy' is the study of causation in nature, the description of phenomena, and the properties and operations of natural bodies (see ann. 5.1 and 50.6). By the late 17th century Cartesian theory (see Descartes,[B] *Principles* 2–4) and the controversies it engendered were staple parts of university curricula. In the early 18th century leaders of the Royal Society were influential in replacing Cartesian theory with Newtonian theory and experimental philosophy.

For a range of examples of natural philosophy—all discussed elsewhere in these annotations—see Newton,[B] *Mathematical Principles* and *Opticks*; *Leibniz–Clarke Correspondence*; Boyle, *The Sceptical Chymist* and *Origin of Forms and Qualities According to the Corpuscular Philosophy*; English philosopher Kenelme Digby (1603–65), *Treatises*, First Treatise; Galileo, *Two New Sciences*; Scottish mathematician Colin Maclaurin (1698–1746), *An Account of Sir Isaac Newton's Philosophical Discoveries* (published after *EHU* was at the press); French natural philosopher Jacques Rohault (1620–72), *System of Natural Philosophy*; Scottish physician and philosopher George Cheyne (1671–1743), *Philosophical Principles of Natural Religion: Containing the Elements of Natural Philosophy*; and s' Gravesande, *Mathematical Elements of Natural Philosophy*.

26.11 **loadstone]** A loadstone, or lodestone, is an iron oxide mineral known for natural magnetic qualities. In free position, it aligns itself to the earth's poles. Early compasses were constructed from pieces of a lodestone, as Hume implies in a passage in *Dialogues* 8.10. Locke[B] used the lodestone as an example of a natural power (*Essay*

2.23.7); and Arnauld[B] and Nicole[B] present a speculative problem about the earth's rotation and the properties of the lodestone (*Logic or the Art of Thinking*, fourth part, ch. 2 (Buroker, 234, 236)). Treatments of magnetism and the lodestone are found in Descartes[B] (*Principles* 4.133–83); Malebranche[B] (*Search after Truth* 6.2.8); Kenelme Digby, *Treatises*, First Treatise 22.1–9; Boyle, *Some Considerations about the Reconcileableness of Reason and Religion* and *Experiments and Notes about the Mechanical Production of Magnetism* (*Works*, 4: 179–80, 340–5); English author and physician Thomas Browne (1605–82), *Pseudodoxia epidemica* 2.2; and many others. The classic *On the Loadstone and Magnetic Bodies* (1600) by English physician William Gilbert (1540–1603) deeply influenced this literature.

26.24 **billiard-ball]** This passage may be influenced by the thesis in Malebranche[B] that persons 'should not judge that a ball in motion is the true and principal cause of the movement of the ball it finds in its path. They can judge only that the collision of the two balls is the occasion for the Author of all motion in matter to carry out the decree of His will, which is the universal cause of all things' (*Search after Truth* 3.2.3 (224–5)). At 6.2.3 (448–50), Malebranche uses the example of the mind willing an arm to move, which Hume uses at *EHU* 7.13. See also Malebranche, *Dialogues on Metaphysics* 7.11. Hume first uses billiard-balls to illustrate the causal relation at *Abstract* 9.

26.25 **impulse]** collision or impact—a contact that causes motion. See also *EHU* 4.10, 12; 5.5, 11; 6.4; 7.6, 21, 25, 28. For Newton[B] on impulse, see *Mathematical Principles*, definition 8 (explanation, 4–6), and bk. 1, prop. 69, theor. 29, scholium. See also Locke,[B] *Essay* 2.8.11–13. Locke—influenced by Newton to modify his account of impulse—said that a moving billiard-ball 'by impulse . . . sets another Ball in motion' by communicating its motion to the second ball (*Essay* 2.21.4).

27.28 **no philosopher, who is rational and modest]** This paragraph presents a number of themes in experimental philosophy; see the next annotation for themes in Newton[B] and others.

27.29 **ultimate cause]** Natural philosophers were divided about the nature of ultimate causes, forces in nature, and the like. In *Letter from a Gentleman* 32 Hume (or his expository editor, Henry Home) offers the following opinions on the history of the problem: 'all the antient Philosophers agreed, that there was a real Force in Matter. . . . The Schoolmen supposed also a real Power in Matter. . . . No one, till *Des Cartes* and *Malbranche*, ever entertained an Opinion that Matter had no Force either *primary* or *secondary*, and *independent* or *concurrent*.' In *THN* Hume discusses Cartesians who believe that 'the ultimate force and efficacy of nature is perfectly unknown to us' and who place all ultimate causation in the deity (*THN* 1.3.14.8–9). See ann. Section 7.21–4 and the discussion of ultimate causes and principles three annotations below.

27.33 **greater simplicity]** a reference to the methodological principle called 'Ockham's Razor'. In *Dialogues* 5.9 (cf. *THN* 3.3.1.10) Hume portrays the principle as follows: 'To multiply causes, without necessity, is indeed contrary to true

philosophy.' Hume mentions Newton's rules below (*EHU* 8.4); the principle of simplicity is rule 1 in Newton's list.

27.38 **cohesion]** 'Cohesion of parts' of matter refers to the phenomenon of the parts of solid bodies adhering or sticking together; see ann. 26.5 on Hume's example of pieces of marble. Newton[B] was a basic source for these scientific concepts, and many philosophers had offered theories of the phenomenon. See ann. nn. 16–17 for Hume's interests in the scientific literature.

27.39 **ultimate causes and principles]** Experimental philosophy could be interpreted as rooted in methods designed to determine nature's ultimate causes and principles in so far as they can be discovered. In *Opticks* 3.1 (400–2) Newton[B] provides a summary of his views:

> permanent Particles . . . have not only a *Vis inertiæ* [see ann. n. 16 below] . . . but . . . are moved by certain active Principles, such as is that of Gravity, and that which causes Fermentation, and the Cohesion of Bodies. These Principles I consider, not as occult Qualities, supposed to result from the specifick Forms of Things, but as general Laws of Nature, by which the Things themselves are form'd; their Truth appearing to us by Phænomena, though their Causes be not yet discover'd. For these are manifest Qualities, and their Causes only are occult. And the *Aristotelians* gave the Name of occult Qualities, not to manifest Qualities, but to such Qualities only as they supposed to lie hid in Bodies, and to be the unknown Causes of manifest Effects: Such as would be the Causes of Gravity. . . . To tell us that every Species of Things is endow'd with an occult specifick Quality by which it acts and produces manifest Effects, is to tell us nothing: But to derive two or three general Principles of Motion from Phænomena, and afterwards to tell us how the Properties and Actions of all corporeal Things follow from those manifest Principles, would be a very great step in Philosophy, though the Causes of those Principles were not yet discover'd.

See, further, Newton,[B] *Mathematical Principles* 3, general scholium (Motte–Cajori, 547).

28.2 **trace up the particular phænomena]** Compare *THN* Introduction 8 on 'tracing . . . to the utmost', meaning following the direction of experiments where they take us in the attempt to understand a phenomenon.

28.4 **ignorance . . . ignorance]** These themes about ignorance resemble themes in Locke,[B] *Essay* 1.1.4–7, 4.3.22–9; Malebranche,[B] *Search after Truth* 3.4.1.2, 5; and Chambers, *Cyclopædia*, 'ignorance'. See related discussions of ignorance in Montaigne, 'On Experience' (*Essays* 3.13) and 'Apology for Raymond Sebond' (*Essays* 2.12; Screech, 634); Boyle, 'Of Men's Great Ignorance' (*Works*, 3: 470 ff.); Glanvill, *Scepsis scientifica: or Confest Ignorance* 1–6, 9–16; Arnauld[B] and Nicole,[B] *Logic or the Art of Thinking* (fourth part, ch. 1; Buroker, 227–33); s' Gravesande, *Mathematical Elements of Natural Philosophy*, preface, pp. ii–iii; Browne, *Pseudodoxia epidemica* 1 ff.; and French mathematician and scientist Marin Mersenne (1588–1648), *La*

*Vérité des sciences* 1.2–3. Hume offers numerous comments on causal ignorance in his *Dialogues*.

28.12 **mixed mathematics]** 'Mixed mathematics' refers to mathematical applications in physical theory, as in mechanics. 'Mixed' contrasts with 'pure'. Galileo and Descartes[B] had envisioned natural philosophy fashioned on mixed mathematics, but Newton[B] was the first to quantify a sizeable realm of phenomena. See the Newtonian explanation of mixed mathematics in s' Gravesande, *Mathematical Elements of Natural Philosophy*, preface, 1: ii, and 'An Oration concerning Evidence', 1: xxxix.

28.18 **compound ratio . . . solid contents]** See Newton,[B] *Mathematical Principles*, definition 2; Maclaurin, *Newton's Philosophical Discoveries* 1.12 (2: 105–6). Hume's formulation is close to that of Maclaurin, who adds that 'There appears to be no ground for making a distinction between the *quantity of motion* [the term in Newton's second definition] and the *force* of a body in motion.' However, it is unlikely that Hume had seen Maclaurin's manuscript, published in 1748. For Maclaurin's teaching of Newton at Edinburgh, see Henderson, 'Short Account', 372.

28.21 **Geometry . . . discovery of the law]** Newton[B] insists that even if confirmed, *exact* mathematical formulations do not ensure the truth of a physical theory. Newton's rule 4 prescribes that:

> In experimental philosophy we are to look upon propositions inferred by general induction from phenomena as accurately or very nearly true, notwithstanding any contrary hypotheses that may be imagined, till such time as other phenomena occur, by which they may either be made more accurate, or liable to exceptions. (*Mathematical Principles* (400); see also definition 2, laws 1 and 3, and rules 1–3 (1, 13–14, 398–400).)

For other possible historical precedents for Hume's reflections in this paragraph, see Locke,[B] *Essay* 4.3.14, 26.

29.22 **powers . . . bread]** Malebranche[B] had used the example of bread (*Search after Truth* 6.2.2) to explicate causal relations without recourse to powers or to an intricate mechanism of parts. Hume initiated the example of bread at 4.7 above and pursues it at 4.21 below.

29.27 **wonderful force . . . distant conception]** Compare Malebranche,[B] *Search after Truth* 6.2.3; and see ann. 26.24 on billiard-ball collision. See also Newton,[B] *Mathematical Principles*, laws 1 and 3. Maclaurin's *An Account of Sir Isaac Newton's Philosophical Discoveries* (pp. 112–16) is instructive, though not a likely source of Hume's knowledge of the relevant science.

30.23 **medium]** This term possibly refers to the middle term or proposition in a syllogism (Aristotelian syllogistic); see the useful body of definitions in Chambers, *Cyclopædia*, 'medium'. Hume's usage seems particularly close to the notion of intermediate ideas in demonstration and probability in Locke[B] (*Essay* 4.17.15–16); see *EHU* 4.21 below.

30.38 **two kinds]** See ann. 24.2 for this division of two types of reasoning and proposition, namely *relations of ideas* and *matters of fact*.

31.13 **probable only]** Compare Gassendi's arguments to show that it is not possible to demonstrate the universality of propositions arrived at by induction (*Exercises Against the Aristotelians* 2.5.5, citing Aristotle[B] and Porphyry); see also his views about probability and the criterion of truth (*Syntagma*: Logic 2.5). Bacon[B] held that induction determines various 'degrees of certainty' (see *Novum organum* 1 and preface); compare Hume's idea of 'proofs' (see n. 10). See also the related use of probability in Locke[B] (*Essay* 4.15), who rejects the language of 'certainty'. Hume's *Abstract* contains a succinct statement of his views on induction.

31.18 **experimental conclusions]** See ann. 5.1 and *THN* Introduction 7 and 1.3.15.11; this work bears the subtitle *An Attempt to introduce the experimental Method of Reasoning into Moral Subjects*. Hume uses 'experimental' to include observation as well as experimentation. On *experimental conclusions*, compare Locke,[B] *Essay* 4.3.29; and Hobbes, *Leviathan* 3.7–8, 10.

31.28 **guide of human life]** Cf. *EHU* 5.6. Hume may have been influenced by Cicero[B] and Butler. Cicero maintained that 'many sensations are *probable*, that is, though not amounting to a full perception they are yet possessed of a certain distinctness and clearness, and so can serve to direct the conduct of the wise man' (*De natura deorum* 1.5.12). Compare Butler's celebrated thesis about probability as 'the very guide of life' (*Analogy*, introduction); Wollaston, *Religion of Nature Delineated* 3.16; and Hume, *Abstract* 4, which mentions the insights of Leibniz,[B] Locke,[B] Malebranche,[B] and Arnauld[B] and Nicole.[B]

32.30 **intuitive . . . demonstrative]** The intuitive is that which is known immediately to the apprehending mind; it is self-evident and independent of inference or reasoning (though in some theories known through reason). The demonstrative is an uninterrupted sequence of self-evident steps in reasoning. For an influential treatment, see Descartes's *Rules for the Direction of the Mind*, esp. rule 3 (1: 14–15), and *Discourse on the Method* 2. See also Locke's definitions of *intuition* and *demonstration* and his use of the expressions 'intuitive Knowledge' and 'demonstrative Knowledge', *Essay* 4.2.1–14. Descartes[B] and Locke,[B] like Hume (in some passages, esp. in *THN*), excluded probable belief from the category of knowledge. See Hume's use of the various interconnected notions at *EHU* 4.1, 16, 18, 21; n. 10; n. 18; *THN* 1.3.1.2, 1.3.7.3, 1.3.14.35, 1.4.1.1; and *Abstract* 18.

## SECTION 5

35.7 **philosophic sage]** For philosophical writings on the ideal wise person or sage, see the Stoic Seneca (1st c. AD), especially 'On Tranquillity of Mind' 2.4 (in *Moral Essays*), and Epicurus[B] (*Epicurus Reader*, texts 3.85–7; 4.128–31; 9; 16.53). For

further information on Hume's views, see 'Epictetus . . .', immediately below; *EPM* 7.16; *NHR* 12.22; 'The Stoic' 5, 12–13, 18.

35.9 **Epictetus,[B] and other Stoics]** The Stoics, among them Epictetus, recommended freedom from control by the passions and the demands of public life. Epictetus' teaching centred on reflective self-examination (*Discourses* 1.6) and moral purpose (*Discourses* 1.4, 1.18.15–20); on tranquillity and the sage, see *Discourses* 2.2. See also ann. 76.24 and 91.4; Hume's comments on the Stoics and Epictetus at *EPM* 7.16–17 and Appx. 4.14; and *NHR* 12.22.

35.9 **system of selfishness]** The reference is to the Stoic preference, especially in Epictetus,[B] for a focus on cultivation of the self (self-mastery, self-salvation, and the like). For Epictetus' views, see the previous annotation and *Discourses* 2.11; *Fragments* 14. For Seneca's views, see 'De beneficiis' 4.1–3, in *Moral Essays*, where he criticizes Epicureans for viewing virtue as the vehicle of pleasure. In *EPM* Appx. 2.3–4 Hume refers to Hobbes, Locke,[B] and other philosophers, including 'Epicurus and his sect', as proponents of 'the selfish system of morals'.

35.18 **Academic or Sceptical philosophy]** See *EHU* 12. 'Academics' is here a term for a type of sceptic and does not merely designate those such as Arcesilas (4th–3rd c. BC) and Carneades (3rd–2nd c. BC), who shaped the history of Plato's Academy. Cicero,[B] one of Hume's most frequently cited authors, was influenced by teachings of the Academics. See especially *Academica* and *De natura deorum* 1.5.11–12.

35.19 **talk of doubt and suspence of judgment]** See Cicero,[B] *Academica* 1.12.45, 2.18.59, 2.31, 2.32.103–4, 2.46.141, on the academic sceptics' position.

35.28 **groundless reproach and obloquy]** Ancient philosophers such as Epictetus[B] (*Discourses* 1.5, 'Against the Academics') and modern philosophers such as Malebranche[B] (*Search after Truth* 1.20.3, 2.3.5) harshly judged academic sceptics.

36.17 **sudden into this world]** Compare the example of Adam at *EHU* 4.6; *Abstract* 11–14; *DIS* 2.47; *THN* 2.1.6.9.

37.1 **custom or habit]** In *Abstract* 15–21 Hume connects his account of custom to what he calls in the subtitle of that work the 'chief argument' of his *Treatise*. See also *THN* 1.3.6, 1.3.8.10–14, 1.3.13.9–11, 1.3.14, 2.3.1.16, 2.3.5. Compare the treatments of custom (and habit) in Blaise Pascal,[B] *Pensées* 67, 94, 158–9, 454, 661, 680 (Levi nos.); Locke,[B] *Essay* 2.33.6–7; and Hutcheson, *Inquiry into the Original*, Treatise 1, 7.

37.13 **constant conjunction]** Hume makes related comments on constant conjunction in *THN* 1.1.1.8; 1.3.6.3–4, 8, 11–16; 1.3.11.11; 1.3.12.25; 1.3.14.12, 31–3; 1.3.15.1.

n. 8 **Tiberius[B] or a Nero[B]]** The reign of the Julio-Claudian emperors began with Tiberius' ascendancy in AD 14 and ended with Nero's death in AD 68. In *EPM* 5.34 Hume makes a related comment and invokes accounts of these emperors found in

Suetonius[B] (see *Lives of the Caesars* 3, 'Tiberius', and 6, 'Nero') and Tacitus[B] (see *Annals* 16.21–35).

39.20 **natural instincts]** This controversy about the roles of instinct and reason is explored below in Section 9, especially 9.6). See also *Abstract* 6, where Hume proposes that 'all our passions are a kind of natural instincts, derived from nothing but the original constitution of the human mind'. Hume may have been influenced by many since Aristotle[B] who have employed the language of 'natural instinct'. For a spectrum of modern opinion, see Lord Herbert of Cherbury, *De veritate*, 'Instinctus naturalis'; Montaigne, 'Apology for Raymond Sebond', *Essays* 2.12 (Screech, 512); Gassendi, 'Letter to Diodati' (Brush, 111); Leibniz,[B] *New Essays* (pub. 1765) 1.2.3, 9; Pascal,[B] *Pensées* 25 and 176 (Levi nos.); and French philosopher Julien Offray de La Mettrie (1709–51), *Machine Man*, 13. See also the uses of 'natural instinct' in *EHU* 9.3, 12.7, 12.16, and 12.25.

39.35 **PART 2]** Excepting the final two paragraphs in part 2, the theory of belief in this part is related to material in *THN* 1.3.5, 7–8 (see also Appendix 2–9) and *Abstract* 16–22.

40.6 **fiction and belief ]** In some works, but not *EHU*, Hume uses 'fiction' to refer to an invention of mind that is neither voluntary nor arbitrary. For a theory of non-voluntary invention, see *THN* 1.1.6.2 and 1.4.3.5; see also *THN* 1.4.3.1, 4–7; 1.4.4.2; 1.4.5.3.

40.9 **voluntarily annex . . . not in our power to believe]** This thesis that belief is involuntary may be a challenge to the Cartesian theory (with less extreme predecessors in the Stoics and St Augustine) that judgement is a matter of voluntary assent. In Descartes's account affirming or denying propositions (as well as abstaining from making judgements) is free activity traceable to the will. See *Meditations* 4 (*Philosophical Works*, 1: 39–42).

40.11 **man . . . horse]** Hobbes (*Leviathan* 2.4) and Berkeley[B] (*Principles*, introduction 10) discuss combining man and horse in the imagination. See also the opening lines of Roman poet Horace (1st c. BC), *Art of Poetry*, on connecting a human head to the neck of a horse and the discussion of joining parts of man and horse in Locke,[B] *Essay* 2.32.25.

40.40 **belief . . . vivid, lively]** For a fuller development of these ideas about the nature of belief, see *THN* 1.3.7.5–7; 1.3.8.11, 15; 1.3.9.8. At 1.3.7.5 Hume says that the notion of belief 'may be most accurately defin'd [as] A LIVELY IDEA RELATED TO OR ASSOCIATED WITH A PRESENT IMPRESSION'.

42.29 **plead in excuse for the mummeries]** refers to the defence of certain religious rituals, ceremonies, rites, or performances. Protestants used the term 'mummeries' derogatorily to suggest ceremonial masquerading. This notion was associated with Roman Catholic beliefs and rituals that seemed superstitious to Protestants, such as the belief that the Host (the wafer) becomes the body of Christ when consecrated. A virtually identical passage occurs at *THN* 1.3.8.4.

n. 9 **de finibus]** Footnote reference: Cicero,[B] *De finibus bonorum et malorum* 5.1.2. While passing an afternoon at the Academy, Piso (a character in Cicero's dialogue) discusses the power of the setting to intensify emotions and focus thinking. Hume quotes Piso's comments on the stimulation of his ideas of historical figures while near the Academy and the senate building:

> Why are we more affected, asked Piso, when we learn that the places we see were often frequented by famous men than we are when we hear a report of the same men's exploits or read a written account of them? Is it a natural endowment we have, or is it some sort of aberration? I feel the effect now, for example. For I am put in mind of Plato, who we are told was the first to practise disputation here; indeed the adjoining gardens not only bring him back to mind but seem to place the man himself before my eyes. Here is Speusippus, here Xenocrates, and here his follower Polemo: The bench we see over there was Polemo's. In the same way, even when looking at our own senate building—I mean the Hostilia, not the new building, which looks slighter to me since it was enlarged—I used to think of Scipio, Cato, Laelius, and especially my grandfather. So great is the suggestive power of places, that it is no accident that they shape our memory training.

Speusippus,[B] Xenocrates,[B] and Polemo[B] were, in the order listed, the three immediate successors of Plato[B] as heads of the Academy in Athens, from 347 to 313. Scipio Aemelianus,[B] Cato the Elder,[B] and Laelius[B] were Roman military and political figures admired by Cicero for their outstanding qualities.

A virtually identical paragraph and an identical passage from Cicero's *De finibus* appears in *THN* 1.3.8.5 n. (originally published in the Appendix), although variants appear in the Latin.

43.19 **relicts of saints and holy men]** Several books on this subject were available to Hume, among them Edward Gee, *The Texts Examined which Papists cite . . . concerning the Worship of Images and Relics* (originally published 1688) and the famous work by Jean Calvin, *Traitté des reliques*, which had been translated into English. Relics were discussed in several works referred to below in the annotations for Section 10.

44.29 **pre-established harmony]** a term derived from the 'harmonie préetablie' of Leibniz.[B] In *Dialogues* 10.6 Hume appends (in a similar context) the footnote 'That sentiment had been maintained by Dr KING and some few others before LEIBNITZ; though by none of so great fame as that GERMAN philosopher.' The first reference is to William King (1650–1729), archbishop of Dublin; see his *Essay on the Origin of Evil* 2–3, 5.5.2–3. Leibniz held that God created every individual atomic unit in the universe so that whatever happens to each such unit is the result of its nature. See *Leibniz–Arnauld Correspondence*, 23 Mar. 1690, and *Theodicy* (Farrer–Huggard, 133, 157, 245, 304, 337).

45.1 ***final causes***] a term derived from Aristotle's account of the four causes or four types of change in nature (*Physics*, 198$^{a}$14–$^{b}$19; *Metaphysics* 1013$^{a}$24–$^{b}$28). Like

'pre-established harmony', 'final cause' can refer to the purposes, ends, goals, or designs in nature. For 'those, who delight' in final causes, see Boyle, *A Disquisition about the Final Causes of Natural Things* (*Works*, 5: 392–444). Gassendi, Leibniz,[B] and Newton[B] discussed final causes favourably, as did Keill in *An Examination of Dr. Burnet's Theory of the Earth* . . . (63–4) and French mathematician Abraham de Moivre (1667–1754), in *The Doctrine of Chances* (252); but no treatment rivals Boyle's for comprehensiveness. See, further, Hume's mention of final causes in *Dialogues* 2.9, 14; 3.7; 4.13; 6.4; 10.37.

45.2 **wonder and admiration]** Pope (*Essay on Man*, epistle 1, especially lines 281–94; epistle 3, lines 1–26, 111–14) was one of those who shared features of the optimistic outlook on harmony found in Leibniz.[B]