INTRODUCTION

David Hume (1711–76) was one of the great philosophers (arguably the greatest) of that prodigiously fruitful era known as the early modern period. During the seventeenth and eighteenth centuries, scholastic Aristotelianism, a world-view which had dominated thought for many hundreds of years, finally began to be overshadowed by a recognizably modern scientific perspective. René Descartes (1596–1650), building on the discoveries of Galileo Galilei and others, was the first philosopher seriously to threaten Aristotle's dominance. Then in the next generation, John Locke (1632–1704) developed a rival account of the world, incorporating scientific developments from England associated particularly with Robert Boyle and Isaac Newton. By the end of the seventeenth century, scholasticism was in terminal decline, but intense debate continued as philosophers sought to make sense of the world and man's place in it, accommodating the new discoveries. Some of the points in dispute were essentially scientific, but many others concerned what we would now call *epistemology* (i.e. theory of knowledge) or *philosophy of science*, and many of the most intractable also had a theological dimension. Both Descartes and Locke found ways of tying these threads together, and they were followed by others, such as respectively Nicolas Malebranche (1638–1715) and George Berkeley (1685–1753), who later developed their theories in novel ways.

Despite this variety of speculation, these thinkers all shared some important assumptions, notably a view of the world as created by divine reason, and—relatedly—as potentially 'intelligible' to human reason. Hume's special significance is as the first great philosopher to question both of these pervasive assumptions, and to build an epistemology and philosophy of science that in no way depend on either of them. Over a century before Charles Darwin's *Origin of Species* of 1859, Hume argued powerfully that human reason is fundamentally similar to that of the other animals, founded on instinct rather than quasi-divine insight into things. Hence science must proceed by experiment and systematization of observations, rather than by metaphysical theorizing or a priori speculation. This outlook, revolutionary in its time, was to be powerfully vindicated during the twentieth century

as the successes of relativity theory and quantum mechanics forced scientists—often very reluctantly—to accept that intuitive 'unintelligibility' to human reason is no impediment to empirical truth. Hume's once scandalous message has thus become almost scientific 'common sense'. Outside the laboratory, however, we still inhabit a world infused with ancient assumptions, and largely blind to the need for, or the consequences of, their abandonment. So Hume's attempt to forge an empirically based, naturalistic world-view retains a unique contemporary relevance.

Hume's first publication, *A Treatise of Human Nature* (1739–40), began as 'an attempt to introduce the experimental method of reasoning into moral subjects'. But in both advocating and pursuing the empirical study of the human world, the juvenile Hume 'was carry'd away by the Heat of Youth & Invention' (see p. 163), producing a long work in which his strokes of critical genius were confusingly mingled with unrealistically ambitious psychological generalizations and—at least in Book I—unresolved sceptical paradoxes. Hume quickly regretted this, as his letters testify, and even before the final Book III of the *Treatise* was delivered from the press, he was already reformulating his approach in the short 1740 *Abstract* (included in this volume as Appendix I). By 1748 he had produced a second major work, the *Enquiry concerning Human Understanding*,[1] following the pattern of the *Abstract* in focusing on his central philosophical message, expanding and clarifying the key arguments that support it (for example in Sections IV, VII, and VIII), and limiting his psychological speculations to modest hints of 'explications and analogies' (*E* 5.9). The sceptical paradoxes are also limited or 'mitigated', but this, perhaps surprisingly, gives the *Enquiry* more rather than less critical bite. Anyone who reads the *Treatise*—with its radical suggestions that even our trust in logic is ill-founded, and that even our basic beliefs in external objects and the self are incoherent—may be puzzled but is unlikely to be convinced. If *everything* is equally doubtful, then most people will hang on to what is comfortable, and though radical scepticism may do something to jolt the complacent dogmatist, it is unlikely to yield any settled change of mind. The *Enquiry* is more potent, because more discriminating. It reveals the relatively humble basis of

[1] Called 'the first *Enquiry*' to distinguish it from the 1751 *Enquiry concerning the Principles of Morals*.

human reason, in much the same way as Book I of the *Treatise*, but instead of going on to advocate ever more radical forms of scepticism, it then takes human reason seriously for what it is, and builds on it a persuasive structure that can vindicate disciplined modern science while condemning traditional metaphysics and irrational superstition.

The magnitude of Hume's achievement is best appreciated by surveying the depth of the tradition he undermined, stretching back to the beginnings of philosophy in ancient Greece. Although, as we shall see, the early modern world into which he was born had already rejected much of its medieval dogmatic legacy, that legacy was replaced with a new dogmatism which was less obvious because so pervasive. Having identified the common threads that linked the ancient, medieval, and early modern worlds, we shall then be in a position to turn with more appreciation to the pages of the *Enquiry concerning Human Understanding*, one of the very finest works of philosophy and the authoritative statement of David Hume's mature epistemology.

1. *From Ancient to Modern Cosmology*

Aristotle was supremely honoured in the medieval period because his philosophical outlook could be comfortably combined with Christianity, a synthesis impressively refined by Thomas Aquinas (1225–74). The Christianization of the Roman Empire had long since brought about the suppression of all the pagan schools of philosophy that had thrived in ancient Greece (such as the Academic and Pyrrhonian sceptics, the Epicureans, and the Stoics).[2] These rival traditions were then largely forgotten until the Renaissance, when pagan manuscripts that had been preserved in the Greek or Muslim worlds were brought west by scholars fleeing the Ottoman Turks. Suddenly a range of new intellectual horizons opened up, combining with other events to prompt a general questioning of traditional authority. Population growth, technological innovation (notably gunpowder), and the discovery of new lands, cultures, and religions unknown to the ancients,

[2] The Roman emperor Theodosius I ordered the destruction of pagan temples (including great libraries such as that in Alexandria) in 391; the emperor Justinian then suppressed all the remaining pagan schools in 529. For a brief review of the various philosophical traditions mentioned here, see the Glossarial Index of Major Philosophers and Philosophical Movements, below. Likewise the Glossary can be consulted for unfamiliar technical terms or antiquated meanings.

all provoked political, economic, and doctrinal instability. Finally the Reformation, starting with Martin Luther's rebellion against the Church of Rome in 1517, led to widespread religious wars founded on philosophical differences: one side took Church authority and tradition as the criterion of truth, the other appealed instead to the Spirit of God acting within the individual believer. Suddenly traditional authority looked open to doubt, and the questions of the rediscovered ancient sceptics became highly relevant, inspiring natural philosophers (i.e. scientists) to examine the world with a more critical eye.

Aristotelian physics and cosmology was based on the idea that material things have *natural* movements according to their elemental composition. The four terrestrial elements, earth, water, air, and fire, of which everything below the Moon is composed, *strive* to reach their natural place in the cosmos: earth at the centre, water in a sphere around the earth, then air and fire. Stones thus naturally fall towards the centre of the universe because they mainly consist of earth, while fire rises. Heavenly bodies such as the stars, however, are seen to move perpetually in circles around the Earth, implying that they are made of a fifth element, a celestial 'ether', which Aristotle took to be some kind of crystalline solid. Again these movements are driven by a *teleological* (i.e. purposive) striving: heavenly bodies eternally move in circles because this is the nearest they can approach to the pure actuality of God, the unmoved mover. Around the Earth at the centre of the universe, the Moon, planets, Sun, and stars are arranged in a series of concentric crystalline shells, forming a heavenly clockwork driven by the steady rotation of the outermost sphere, repeating its circuits eternally with perfect accuracy, while generating the dance of the planets as seen in the sky. However, the visible motion of the planets is in fact very far from being a steady circular movement around the sky: sometimes a planet will 'regress' for a time, moving backwards from day to day before turning again to continue in its usual direction. Accounting for this observed complexity requires much more than a simple pattern of circular orbits, and over the years the Aristotelian model was progressively refined, most notably with the addition of *epicycles*, or orbits around orbits. It eventually achieved definitive form through the work of Ptolemy around AD 150, and was then destined to dominate European astronomy for almost 1,500 years.

In 1543 Nicolaus Copernicus famously advanced the theory that the Earth is a planet orbiting the Sun, but it was not until the early

seventeenth century that observational evidence became available to mount a decisive challenge to Ptolemaic astronomy. In 1609–10 Galileo Galilei made his own telescope (a device invented only in 1608) and viewed the heavens in unprecedented detail, immediately publishing what he saw in *The Starry Messenger*.[3] Amongst his discoveries were craters, mountains, and valleys on the moon, whose dimensions could even be gauged from the observed shadows, and whose existence suggested a world much like our own, of rugged rocky irregularity rather than smooth etherial perfection. Likewise the four Galilean moons orbiting around Jupiter undermined the idea that all celestial motion must centre on the Earth, while the sequence of the phases of Venus in shapes from crescent to almost circular—invisible to the naked eye but very obvious through a telescope—gave decisive evidence against the Aristotelian-Ptolemaic model of the planetary orbits. Less decisive, but imaginatively suggestive of the need for a new world-view, Galileo saw innumerable new stars of varying brightness, seeming to stretch out well beyond the crystalline sphere that was supposed to hold the known visible stars.

2. *From Aristotelian to Cartesian Intelligibility*

If the Earth is not at the centre of the universe, then not only Aristotle's cosmology, but also his account of terrestrial motion must be seriously in error. Moreover when tested critically, specific predictions derived from his theories were found to be quite wrong, even applied to such everyday things as the flight of a cannon ball, a sledge sliding over an icy pond, the dripping of water from a gutter, or the fall of stones of different sizes. Galileo is reputed to have demonstrated this publicly, by dropping a heavy and a light ball simultaneously from the Tower of Pisa, both falling with similar speed.[4] He went on to develop

[3] Galileo's weren't the only relevant observations. In 1572 Tycho Brahe had observed a supernova, and in 1604 Johannes Kepler observed another (also seen by Galileo). Meanwhile in 1577, a major comet appeared, which Brahe—by triangulation against observations of astronomers elsewhere in Europe—proved to be more distant than the Moon. All these indicated that the heavens beyond the Moon were far from the eternally incorruptible domain envisaged by Aristotle (who had dismissed comets and meteors as atmospheric phenomena, hence the word 'meteorology'). See p. 160 below for Hume's comment on the significance of this undermining of the distinction between the heavenly and earthly domains.

[4] Aristotle claimed that heavy objects fall faster than light ones in proportion to their weight, whereas in fact they usually fall faster only very marginally, the difference being

an alternative theory of motion, based on the concepts of *inertia* and *forces*. This was taken further by René Descartes (or 'Des Cartes')—widely considered the first great early modern philosopher—and it was his 'Cartesian' mechanics that was to dominate the thought of much of the seventeenth century.

Galileo and Descartes between them established a new way of understanding the physical world, replacing purposive strivings (what Aristotle had called 'final' causes) by mathematically formulated laws framed exclusively in terms of mechanical, 'efficient' causation. The new science took bodies to be essentially passive, their movement changing according to the action of external forces. Left to themselves, bodies will simply maintain their state of rest or uniform linear motion, this so-called *inertia* applying equally whether the body is stationary or moving in any direction (so the concept of *natural* place or direction is completely abandoned). A body's motion changes only when it is acted upon by a force, though the precise magnitude of the force associated with changes of movement remained a matter of controversy.[5]

Descartes's vision of mechanics had an elegant simplicity, and also a reassuring air of *intelligibility*. In place of Aristotle's five elements with their somewhat arbitrary 'natural' tendencies, Descartes substituted a single type of matter, whose *essence* (i.e. central defining quality) he identified as simple spatial *extension* (i.e. geometrical size). All the fundamental properties of matter then supposedly follow logically from this essence, in a way intelligible to our rational (and immaterial) minds; for example, extension implies no power of initiating change, so matter's passivity and inertia are fully explained.[6] This approach also provided an ingenious solution to the resulting problem of accounting for the motion of the planets as well as cannon balls. If the essence of matter is extension, then empty space—that is, extension

due to air resistance. In 1971, David Scott of Apollo 15 performed Galileo's experiment on the Moon, showing that a hammer and a feather indeed fall at the same rate in the absence of air.

[5] The so-called *vis viva* controversy is alluded to by Hume in the *Enquiry*, at *E* 7.29 endnote [E].

[6] This is of course only a brief caricature of Descartes's position. He was far less rationalist about the practical conduct of scientific enquiry, viewing experiment as the means of discovering which mechanisms are actually operative in nature. Note also that he sees mind as a substance quite distinct from matter, whose essence is *thought* rather than extension. For a typically forthright Humean dismissal of such 'substance dualism', see the beginning of his essay 'Of the Immortality of the Soul' (Appendix II, below).

without matter—becomes an impossibility, so the entire universe must be filled with matter (i.e. the universe is a *plenum*). But in such a plenum, movement of one piece of matter can happen only if another piece 'moves out of the way', and as soon as it itself moves, its place must be taken by yet another piece of matter. Hence all motion through space must involve matter moving in circuits, and Descartes concluded that the universe must be structured by 'vortices', or whirlpools of circulating matter. This provides a very elegant explanation of how the planets can be retained in circular motion around the Sun despite their inertial tendency to move in straight lines. The Sun is thus the centre of a giant vortex, with smaller vortices within it ranging from that which carries the Moon around the Earth, down to the minuscule vortices in our own bodies that constitute the mechanisms of these intricate machines.

Aristotelian physics had likewise aspired to make the operations of nature intelligible, by explaining the behaviour of things in purposive terms, but such explanations now came to seem vacuous compared with those of the new science. This is the point of Molière's clever parody in Act III of his play *Le Malade imaginaire* (1673):

'I would like to ask you the cause and reason why opium makes one sleep.'

'The reason is that in opium resides a *dormitive virtue*, of which it is the nature to stupefy the senses.'

Here the appeal to 'dormitive virtue' is clearly no more than giving a fancy name to an unknown cause of the observed phenomenon. Any appearance of explanation is entirely bogus, and most natural philosophers understandably became anxious to distance themselves from such *occult qualities*. They accordingly aimed to confine their explanations to *efficient* rather than *final* causation (i.e. processes that bring things about rather than purposes), and to appeal only to causal mechanisms that depend on the types of qualities manifested in experience and whose mode of operation seems intuitively comprehensible, such as size, shape, and motion. All this helps to account for the great influence of Cartesian physics, which operated exclusively by means of *mechanical* causation: interaction between contiguous parts of matter by pressure and impact. Such causation has a reassuring familiarity (since its action can be observed amongst everyday things such as water and billiard balls) and also an apparent *intelligibility* (in that it operates through physical touching which requires only familiar

geometrical properties). Hence the appeal of this sort of 'mechanical philosophy' was not confined to the followers of Descartes.

3. *Corpuscularianism, Locke, and Newton*

A less rationalistic form of mechanism was inspired by the atomism of the ancient Epicurean school, and championed initially by the Frenchman Pierre Gassendi. However, it flourished better in Britain, whose natural philosophers tended to be suspicious of the Cartesian attempt to derive scientific principles from pure reason, and followed Francis Bacon in emphasizing the role of experimentation. Robert Boyle, one of the most influential scientists of the seventeenth century,[7] advocated what he called 'corpuscularianism', a name that avoided the atheistic associations of Epicurean atomism. Boyle's interest in chemistry led him to speculate that material substances are composed of imperceptible 'corpuscles' whose physical interactions on the atomic scale are responsible for the large-scale perceived properties. All corpuscles are formed from the same 'universal matter', and the various properties of different substances arise from the way in which these minute corpuscles are organized: their individual size, shape, and motion, and the resulting texture. It is only these so-called 'primary' qualities that feature in the physical theory, and they are to be distinguished from 'secondary' qualities such as an object's colour, taste, or smell, which represent the effects of the object on the human senses rather than anything genuinely intrinsic to it. Because the primary qualities are essentially geometrical (and hence mathematically describable), this theory—like that of Descartes—held out the promise of explaining objects' behaviour in terms of straightforward mechanical interactions whose results could potentially be calculated. But unlike Descartes, Boyle took matter's fundamental properties to include impenetrability as independent of extension. This opened the possibility of penetrable extension (i.e. extension without matter), thus enabling a distinction to be drawn between atoms and empty space, and avoiding the Cartesian plenum.

Boyle's corpuscularianism became philosophical orthodoxy in Britain through the work of his friend John Locke, a philosopher destined to

[7] It seems that Boyle was a major focus of natural philosophy teaching in Edinburgh when Hume studied there in 1724–5.

eclipse Descartes, and whose epistemology and political theory were to exert huge influence into the nineteenth century and beyond. Locke's monumental *Essay concerning Human Understanding*, published in 1690, explored the materials and limits of human thinking, setting an agenda that Hume would follow in his similarly titled *Enquiry*. Locke's *Essay* is infused with an empiricist spirit, arguing that all our 'ideas' (i.e. the constituents of our thoughts) derive from experience, as does the overwhelming bulk of our knowledge. Locke starts with a vigorous attack on the theory of 'innate ideas', targeting both scholastic and Cartesian attempts to deduce truths by pure reason based on such supposed ideas (as, for example, in Descartes's argument that the perfection of our innate idea of God implies a perfect cause). Locke then goes on to give a thoroughly empiricist account of the origin of our ideas, taking an atomistic approach in which complex ideas are composed of simples, and the simple ideas themselves are directly derived from experience. This experience can be of the external world or of our own minds: thus the senses yield 'ideas of sensation' (such as the redness of a rose), while introspection yields 'ideas of reflection' (such as desire for the rose, or fear of its thorn). Since all such experience is of particular sensations or feelings, the ideas we derive from these are particular also. General ideas (such as the idea of redness in general) then get generated from ideas of particular instances (e.g. the colour of different red flowers) by 'abstraction', in which the differing details (e.g. the varying brightnesses and hues) are ignored, and notice taken only of what is common to all, leaving an 'abstract idea' which is able to represent any instance whatever.

If all our ideas are derived from experience, then it is natural also to see this as the source of all our knowledge of the world, since only our senses can inform us what kinds of things exist and how they behave. Thus Locke, like Boyle, was far more cautious than Descartes, who had claimed to know the entire essence of matter and mind from his innate ideas of extension and thought respectively. For Locke, the essence of both is hidden from us, and the most we can do is to seek a plausible account of them, which will always remain uncertain and answerable to further experience. It is in this spirit that he endorses the 'corpuscularian hypothesis', that material things are made of corpuscles of 'substance in general' (Boyle's 'universal matter') possessing the geometrical primary properties (size, shape, motion, etc.) together with 'solidity' (Boyle's 'impenetrability'). Since we cannot know the

'real essence' of physical substances—e.g. the underlying corpuscular structure of gold—our science of them has to be based on the manifest properties that we perceive, the 'nominal essence' by which we identify them—e.g. the 'Colour, Weight, Fusibility, and Fixedness, *etc.*' of gold, which 'gives it a right to that Name' (*Essay*, III. iii. 18). Science must therefore proceed by careful observation and experiment, with little point to theorizing about underlying essences. Occasionally Locke seems to go further than these modest principles would allow, suggesting that the mechanical behaviour of the corpuscular world could in principle be predicted without experiment if only we had senses sufficient to inspect it in detail:

> I doubt not but if we could discover the Figure, Size, Texture, and Motion of the minute Constituent parts of any two Bodies, we should know without Trial several of their Operations one upon another, as we do now the Properties of a Square, or a Triangle. (*Essay,* IV. iii. 25)

But this remains at most a theoretical speculation, and unlike Descartes, Locke never expresses any serious ambition to deduce physical laws by pure reason.

Descartes's ambition exceeded his reach, and although his thought remained influential for many years, especially in his native France, its practical value never matched its theoretical elegance. The supposed deduction of precise laws of motion from the pure geometry of extension proved elusive, and Cartesian mechanics was unable to yield convincing predictions either of terrestrial dynamics (e.g. flying projectiles and colliding billiard balls), or the celestial orbits of the planets. Indeed the careful observations and calculations of Tycho Brahe and Johannes Kepler had revealed these orbits to be elliptical rather than circular, and this gave particular difficulties for the Cartesian vortex theory. Its death knell came in 1687, when Isaac Newton was able in his *Principia Mathematica* to prove results indicating the impossibility of a vortex yielding elliptical motion. The *Principia*, perhaps the most influential work of science ever published, went on to displace the Cartesian account by formulating a set of mechanical laws that apparently explained both terrestrial and celestial dynamics in exquisite detail. Newton retained Descartes's concept of inertia as his 'first law' (that objects move uniformly unless acted upon by a force), but followed Boyle in replacing the Cartesian plenum with a universe mainly composed of empty space. He then took the controversial

step of positing a force, called 'gravity', acting between bodies across that empty space, proportional to their mass and inversely proportional to the square of the distance between them. Using his newly invented mathematical tool, the calculus, he proved that such a force, acting on bodies in accordance with his second law,[8] would indeed generate elliptical orbital motion amongst bodies in space, and could also explain the parabolic flight and accelerating fall of projectiles near the Earth. Moreover the 'constant of proportionality' required in these two contexts turned out to coincide, strongly confirming both the theory itself and also Galileo's once revolutionary claim that celestial and terrestrial bodies are subject to exactly the same laws.

Despite this success, Newton's postulated gravitational force, acting at a distance and without any intermediate mechanical connexion, seemed to many to be deeply 'unintelligible' and even objectionably 'occult'. Newton's influential response to this objection, in the second edition of *Principia*, was to insist that he 'feigned no hypotheses' (i.e. invented no speculations) about the causes of gravity, and felt no need to do so. If his equations correctly described the observed behaviour of objects, then his theory (including its postulated forces) should be deemed acceptable whatever the underlying reality might be, and speculation about the ultimate cause of gravitational attraction was both unnecessary and inappropriate, unless and until further empirical evidence emerged that might help to throw light on the matter. This somewhat *instrumentalist* position was later to make a deep impression on Hume, whose approach to the metaphysics of causation can be seen as generalizing it to all causes whatever.[9] Amongst natural philosophers, however, although Newton's theory triumphed owing to its sheer accuracy and predictive power, the quest for intelligibility

[8] This law states that if a force F acts on a body of mass m, this causes the body to accelerate—i.e. to change its velocity—in the direction of F, the magnitude of that acceleration being F divided by m.

[9] Instrumentalism is the view that theoretical entities such as forces are to be thought of as useful *instruments* for describing and predicting phenomena, whose value does not depend on their actually corresponding to anything in the real world. Strict instrumentalists (e.g. Berkeley) deny such entities' reality. What we might call *methodological instrumentalists* (e.g. Newton in respect of gravity) see the primary criterion of a theory's scientific adequacy as being independent of whether such entities exist. Hume's position on powers and forces is methodologically instrumentalist in spirit, but with a semantic colouring that interprets *what it means* for a power to exist in terms of its instrumentalist adequacy.

continued, and even Newton himself speculated that gravity might be accounted for by some sort of 'etherial active fluid' permeating space (as mentioned by Hume at *E* 7.25 endnote [D]). However, there are also hints in his writings, made louder and more explicit in his followers, that the very unintelligibility of gravity has religious significance as an argument for God's existence, since only the continuous power of an almighty being could keep the world working in conformity with a law for which there is no conceivable mechanical explanation.

4. *Free Will, and the Dangers of Infidelity*

Throughout this period, religion exerted a profound influence over all philosophical and scientific speculation. No philosopher or scientist could afford to ignore the religious implications of his work, and many were attacked on account of their supposed heresy or 'infidelity'. Galileo's punishment by the Inquisition provides the most famous example, deemed heretical for stating that the Earth orbits the Sun and thus contradicting scriptural texts such as 'The Lord . . . has established the world; it shall never be moved' (Psalm 93: 1) and the famous creation story in Genesis (according to which 'the heaven and the earth' are created 'in the beginning', and the Sun is not made until the fourth day). Hearing of Galileo's condemnation, Descartes withheld his own projected treatise *The World*, and took great pains to exclude anything unorthodox from his published writings. But this did not save his works from being added (in 1663) to the Roman Catholic Index of Prohibited Books, a list that came to include almost every significant work of post-medieval Western philosophy. His offence seems to have been an implicit denial of the doctrine of transubstantiation, that in the ceremony of the Eucharist commemorating the Last Supper, consecrated bread and wine are literally changed in substance into the body and blood of Christ. Such a claim made some sense within the Aristotelian scheme, but ceased to be feasible within a physics such as Descartes's or Locke's that saw the perceptible 'secondary' qualities of things (their colour, taste, smell, etc.) as caused directly by their underlying 'primary' or mechanical structure.

Another theological minefield, raising problems for both Roman Catholics and Protestants, concerned the question of free will. The growth of empirical science, and the mechanical philosophy in

particular, put increasing emphasis on laws of nature and the clockwork predictability of physical phenomena. Hence most of the great philosophers of the seventeenth and eighteenth centuries (e.g. Descartes, Hobbes, Spinoza, Locke, Leibniz, Hume, and Kant) were attracted to *determinism*, the view that every event is brought about by antecedent causes and is therefore predictable (at least in principle) from knowledge of prior conditions and the relevant causal laws. But while determinism in the physical realm was relatively unproblematic, in the human realm it threatened to undermine freedom and moral responsibility. Punishment seems appropriate only when some wrong is committed freely, by an agent who had some choice in the matter. How then could it be right for any judge (human or divine) to punish a wrongdoer, if the act in question was the product of inexorable causal laws, and could have been foreseen by God with absolute certainty before the sinner had even been born?

Many shied away from facing up to this thorny problem; Descartes, for example, is rather vague about whether determinism applies to the immaterial mind. The classic resolution of the dilemma, *compatibilism*, was most clearly formulated by his contemporary Thomas Hobbes, the first great philosopher to write in the English language and a forthright materialist (who provocatively cited Descartes's mental 'immaterial substance' as a paradigm contradiction in terms). Accepting that the (purely material) world is governed by causal necessitation—what he called 'the doctrine of necessity'—Hobbes preserved moral freedom by asserting its full compatibility with determinism:

> LIBERTY, or FREEDOME, signifieth (properly) the absence of Opposition; (by Opposition, I mean external Impediments of motion;) . . . a *FREE-MAN, is he, that in those things, which by his strength and wit he is able to do, is not hindred to doe what he has a will to*. . . . *Liberty* and *Necessity* are Consistent . . . the actions which men voluntarily doe . . . because they proceed from their will, proceed from *liberty*; and yet, because every act of mans will, and every desire, and inclination proceedeth from some cause, and that from another cause, in a continuall chaine, . . . proceed from *necessity*. (*Leviathan*, ch. 21)

Hume is widely seen as following Hobbes here, and indeed uses Hobbesian terminology in Section VIII of the *Enquiry*, 'Of Liberty and Necessity', where he presents his own (subtly different) compatibilist approach.

Compatibilism is now very widely accepted, though it remains controversial, and the nexus of problems surrounding free will—one

of the most ancient in metaphysics—is still hotly debated today. However, three hundred years ago it seemed even more intractable, because of the variety of theological issues with which it interlocked. Thus for example not only causal determinism, but also God's creation and sustaining of the world from moment to moment (an idea much emphasized by Descartes), threatens to make Him responsible for everything that happens, including human sin. Denying determinism might ameliorate this difficulty, but would potentially cast doubt on both God's omnipotence (by implying that some things happen by chance, independently of His decrees) and His omniscience (by making it utterly obscure how God could foresee a yet undetermined future). Another related issue involved the theology of grace and justification, sharpened by Protestant Reformers' emphasis on the 'original sin' we inherit from Adam and Eve and our consequent total depravity that makes us all—even the most apparently virtuous—thoroughly deserving of eternal damnation. Following Augustine, the Reformers insisted that we can be saved from this fate only by the grace of God, which generously grants us salvation through faith in Christ, and not through any merit of our own.[10] But how is it that some achieve this saving faith whereas others do not, given that the distinction cannot be founded on their moral virtue? It seems that God must Himself choose on whom to bestow it, but then if He does so, how can this divine grace be anything other than irresistible? Considerations like these led many Protestants—most notably John Calvin—to the doctrine of *predestination*, implying that the choice of who is destined to go to heaven, and who to hell, was made by God from the beginning of time, quite irrespective of human merit. Opponents of Calvinism found this doctrine morally monstrous, whereby most of mankind (including Christians of rival sects) are doomed to inevitable hellfire owing to the sin of Adam, while God—who could very easily spare all of them from this eternal torture simply by granting them saving faith—in fact spares only very few.

With eternal hellfire or salvation at stake, it is not surprising that religious disputes could become impassioned and aggressive. Hume himself, living in Calvinist Scotland, accordingly took care to avoid overt infidelity, for example suppressing his own potentially incendiary

[10] The Roman Catholic Jansenists (who make an appearance in Section X of the *Enquiry*) took a similar approach, though most Catholic sects put greater emphasis on good works as also contributing to salvation.

treatment of immortality to be published only posthumously.[11] Although religious persecution in Britain had greatly declined after the horrors of the Civil War (1642–51) and the bigotry of Cromwell's Commonwealth (1649–60), it was still possible in 1697 for Thomas Aikenhead, a 19-year-old Edinburgh University student, to be hanged for blasphemous comments made to other students, and even as late as 1733, the Cambridge theologian Thomas Woolston died in prison, having been convicted of blasphemy four years earlier. Hume himself experienced prejudice of a less dangerous kind, being rejected as an applicant for a chair of Philosophy at Edinburgh in 1745 on the ground that his *Treatise of Human Nature* advocated 'Principles leading to downright Atheism' (*L* 17), even though the *Treatise* (for reasons of prudence) contained no explicit discussion of religion. In 1756, the General Assembly of the Church of Scotland debated a motion to excommunicate him (i.e. expel him from the Church), based largely on the religious sections of the *Enquiry* which had been published in 1748, though the motion was rejected. By then, such a condemnation might well have made the Church a laughing stock, but it was still prudent for Hume to tread carefully where Christianity was concerned, and an explicit denial of its central doctrines would be very likely both to provoke a hostile reaction, and also to upset numerous friends. Even in eighteenth-century Edinburgh, the 'Athens of the North' which saw the brilliant flowering of intellectual activity of which Hume was a leading light, religious orthodoxy remained a potent force and a centre of allegiance for the vast majority.

5. *God's Design, and Human Reason*

Amongst the more sophisticated classes of this 'Scottish Enlightenment', however, the nature of religious commitment was profoundly different from either of the types that had been dominant in the seventeenth century. Roman Catholicism, with its ornate rites, magical transubstantiation, and saintly miracles, was now commonly dismissed as 'superstition', while the narrow bigotry and fervent 'enthusiasm' of various Protestant sects was equally despised.[12] Repelled by the vicious

[11] For examples of Hume's other methods of hiding or disguising his atheism, see below pp. 146, 161–2, 202–3.

[12] Accordingly Hume's essay 'Of Superstition and Enthusiasm', in which he critically discusses them both, could safely be published in 1741.

religious wars that these competing movements had inspired, enlightened intellectuals had moved on to a form of Christianity that fully embraced the scientific revolution, with an increasing emphasis on religion as grounded on reason rather than faith. Thus the ancient God of miracles, grace, exclusive revelations, and inexplicable mysteries was largely abandoned in favour of the Great Designer. Specifically Christian doctrines such as the incarnation and resurrection of Jesus were, as always, based on written revelation, with the miracles reported in the Bible playing a crucial role in authenticating both Jesus himself and other biblical figures. But any more recent or controversial revelations (with their divisive doctrinal implications) were downplayed, in favour of an emphasis on *natural theology*: religion as established by reason and science. From this perspective, the 'incomparable Mr. Newton' (as Locke described him) had performed a major service to theology, by revealing the secrets of God's wonderful creation. Hence the famous epitaph by the poet Alexander Pope:

> Nature and Nature's laws lay hid in night:
> God said, Let Newton be! and all was light.

Unlike many thinkers in both earlier and later centuries, those of the Enlightenment—at least in Britain—typically saw no conflict between science and religion, but viewed new discoveries as providing yet more evidence of the intricacy, wisdom, and benevolence of God's handiwork. Science became a religiously informed activity, and reading God's works from 'the great book of nature' was judged a worthy alternative to reading them from the Bible. The Design Argument for God's existence thus became widely viewed as the strongest pillar of natural religion.[13]

With God portrayed as the Great Designer, and human reason demonstrating its own impressive powers in revealing His creation, this naturally encouraged the thought that our faculty of reason has a semi-divine quality, substantiating the biblical claim that we are 'made in the image of God'. Much of our behaviour might be instinctive, or driven by bodily appetites and passions, like that of the other animals. But our reason seemed to be special, providing an insight into rational truth (most obviously in mathematics) that appears to approximate to God's transparent perception. Of course we are

[13] For one of the most famous and elegant statements of the Design Argument, see Part ii of Hume's *Dialogues*, in Appendix III, below.

limited creatures, so our pure rational insight may not extend very far, but the apparent success of philosophers in discovering 'intelligible' laws of nature indicated that it was at least partially applicable beyond mathematics, to the operations of the physical world. Locke, typically, was more modest, acknowledging that even our scientific understanding of the world is at best 'probable' and thus inevitably falls short of the 'demonstrative' certainty of mathematics. But even this mere probable judgement is quite sufficient for our practical needs, and our faculty of reason is just as valuable when we use it to perceive probabilities as when we perceive certainties. God has given us faculties suitable for our position in the world, as creatures intermediate between animals and angels. And though our reason might be fallible and limited, it above all is what elevates us above the beasts. In this, at least, most early modern philosophers could agree with Plato, who saw reason as the central function of the immortal soul, and even Aristotle, who defined man as the one distinctive 'rational animal'.

6. *Inertness, Malebranche, and Berkeley*

The Design Argument was not the only way in which the new science could be harnessed to the benefit of religion. Indeed we saw earlier how the 'unintelligible' nature of gravitational attraction—the fact that it seemed inexplicable in mechanistic terms—could be presented as an argument for God's existence. The 'mechanical philosophy' not only encouraged the perception of the world as a clockwork masterpiece (thereby implying the existence of a master clockmaker); it also implied limits on the essence and powers of matter, which could be exploited for theological gain. Descartes was the first to do this, when he claimed to perceive clearly and distinctly that the essence of matter was different from that of the thinking self, so that the soul must be immaterial and hence could potentially survive the body's dissolution. Locke followed, giving an argument for the existence of God which depended on the impossibility of intelligent thought's arising from the mere primary qualities of matter. However, Locke ventured the opinion that God might, if He wished, 'superadd' thought to matter (*Essay*, IV. iii. 6). This provoked a great deal of hostility, since thought was evidently an 'active' power, whereas the mechanical philosophy (inspired by the concept of inertia) encouraged the

idea that matter was purely passive or 'inert'. Material things were seen as intricate but lifeless machines, their cogs and levers static until set in motion by some external power. This picture would be undermined if a genuinely active power—such as thought, or possibly gravity—were to be ascribed to matter itself. In that case, the apparent need for an external source of power might be removed, with potentially dangerous implications for the existence of both God and a distinct, immaterial soul. So the inertness of matter became a prominent and theologically charged theme in much philosophical discussion, and was to remain so well into Hume's time (e.g. in the work of Samuel Clarke and Andrew Baxter).

Some metaphysicians took these sorts of considerations much further, to the extent of completely denying the causal relevance of matter, or even its very existence. Nicolas Malebranche, the most influential Cartesian of the late seventeenth century, built on Descartes's idea that continual re-creation by God is necessary to sustain the world from moment to moment, drawing the conclusion that no real causal interaction takes place except through the intervention of God. On this account, when one billiard ball hits another, the second ball moves not because of any force in the first ball, but purely because God then chooses to re-create the second ball in an appropriate sequence of positions. The collision of the balls is not a *cause* of the movement, but an *occasion* for God to bring about the relevant behaviour, in accordance with the behavioural laws that He has decreed. Hence this theory (described and criticized by Hume at *E* 7.21–5) is called *occasionalism*. Another of Malebranche's arguments for this theory was based on the common assumption—discussed above—that genuine causation should be *intelligible*. Interpreting intelligibility in a particularly strong sense, he insisted that an event can be a real cause only if it makes the subsequent non-occurrence of its effect inconceivable, so that the cause has a (logically) *necessary connexion* with its effect. Hence the collision of the first billiard ball with the second cannot possibly be the real cause of the second ball's motion, because it would be perfectly conceivable for the one event not to be followed by the other. The only cause capable of satisfying this inconceivability requirement turns out to be the will of God, who is omnipotent and whose intentions are therefore infallibly fulfilled. So again we reach Malebranche's desired conclusion, that God is the only true cause.

Malebranche's occasionalism has the peculiar consequence that every event in the world is really brought about by God, and this applies to the operation not only of inanimate things, but also of our own sensory and motor faculties. When we see an apple, for example, or when we stretch to pick it up, it is God who creates our visual perceptions (which are of ideas in His mind) to correspond with the reality, and it is He who moves our arm (or, strictly, re-creates it moment by moment in changing positions) to correspond with our willed movement. But having gone this far, there might now seem little point in postulating a material world at all, since it does not appear to play any part in what we experience or in explaining what happens (e.g. it is not any powers of the billiard balls that explain their movements, but God's decision to re-create them in accordance with the 'laws of motion' to which He has chosen to conform).[14] Thus some philosophers, impressed by the fundamental notion that matter cannot be active, ended up entirely denying its existence, a view called *immaterialism* or *idealism*. On this view, material objects 'exist' only in so far as we have ideas in our mind that appear to represent them, or God has ideas in His mind that are archetypes of the ideas He wills to create in ours.

The most prominent of these immaterialists was George Berkeley, whose overall position is in many respects similar to that of Malebranche, though with a different emphasis due in part to his place within the Lockean rather than Cartesian tradition. Locke had insisted on a distinction between ideas, which are purely in the mind, and material things, which are the presumed external causes of our perceptual ideas. These ideas represent things as having both primary qualities (such as shape, size, and motion) and also secondary qualities (such as colour, taste, and smell), but our best theory of the world—i.e. Boyle's corpuscularianism—indicates that only our ideas of primary qualities resemble genuine qualities of material things. Berkeley agrees with Locke regarding the essentially mental nature of what is immediately perceived, and the main focus of his arguments is to attack the Lockean view that there is something in addition, some supposed material object 'behind' the perceived apple-idea. In particular,

[14] In a sense, God's choice of the laws of motion is arbitrary, though Malebranche believed that God would inevitably create the best world consistent with His nature, so that His choice of laws would be determined by His wisdom and goodness.

he emphasizes the inconceivability of anything sensory existing outside a mind, and denies that anything unperceived (such as the supposed primary qualities of an external object) could even *resemble* a sensory idea. He then goes on to attack the basis of the primary-secondary quality distinction itself, arguing that since our ideas of primary qualities are inextricably linked with those of secondary qualities (e.g. we see or imagine an object's shape only by seeing or imagining the extent of its colour), it is impossible to conceive the one without the other.[15] Even if some objects resembling our ideas were to exist outside the mind, since those ideas are 'visibly inactive, [with] nothing of power or agency included in them' (*Principles*, i. 25), any such objects would themselves have to be totally inert, and hence quite unable to cause any perception of them. Thus Berkeley reaches the conclusion that the only active things in the universe are minds, or spirits, while everything that we perceive consists of inactive, inert, ideas.

It seems odd that a line of thought inspired by physical science, namely the mechanical philosophy's emphasis on the inertness of matter, should lead to metaphysical positions such as occasionalism and immaterialism that deny physical objects any causal role whatever in the world that we perceive. But Berkeley in particular took pains to develop an account of physical science consistent with his immaterialism, and he did this by taking further the instrumentalism hinted at by Newton. On this account, the aim of science is simply to discover laws that generate true predictions about the perceived phenomena, and it is irrelevant whether the unperceived entities (such as forces) to which those laws appeal actually have any real existence, as long as they provide useful instruments of prediction. If immaterialism is correct, then such forces—and even the material objects that Locke and others suppose to be the causes of our perceptions—do not in fact exist, and the apparent intricacy of the physical world is due not to the interaction of complex material mechanisms, but instead to God's direct action. God benevolently ensures that our perceptions occur in the same patterns as they would if they were caused by such

[15] Berkeley links this with an intense attack on Locke's doctrine of 'abstraction', the process by which we supposedly come to form general ideas. In fact it seems that he misunderstood Locke, whose notion of abstraction (involving 'partial consideration' of some aspects of an idea) is rather similar to Berkeley's. Hume's own account of general ideas, developed from Berkeley's, is sketched at *E* 12.20 endnote [P].

material mechanisms, and He does this precisely to enable us to develop methods of predicting what will happen, and to direct our lives accordingly. Our sensory ideas of objects are thus *signs* from God providing us with predictive information, rather than perceptions of real material things. But this metaphysical position makes no difference to the practice or value of science, which can proceed regardless and yield benefits just as great as if it were genuinely descriptive of an objective material world.

7. *The Humean Revolution*

Against all this background, we are now in a position to appreciate the relevance and the revolutionary implications of Hume's philosophy. Put crudely, he follows the spirit of Locke's empiricism with respect to both the origin of ideas (*Enquiry* Section II) and factual discovery, but develops it far more consistently, ruthlessly dismissing all hints of pure rational insight (e.g. into the powers of matter) and deploying powerful sceptical arguments to undermine even the *ideal* of causal intelligibility.

Hume's first such sceptical argument (Section IV Part i) shows that causal laws can be known only by experience, but that experience gives no real insight into what makes them operate. Hence even the supposed intelligibility of causation by mechanical impact (e.g. of billiard balls) is an illusion, generated by familiarity. He then goes on (Sections IV Part ii and V) to consider how we learn from experience, which Locke had attributed to the rational perception of probable evidential connexions. Hume argues against this that all learning from experience, and hence all factual reasoning, is founded on an instinctive assumption for which we can give no rational basis whatever, namely, that what we have observed is a reliable guide to the unobserved. Thus our capacity for factual reasoning, instead of being a manifestation of angelic rational perception, turns out to be different only in degree from that of the animals (Section IX).

Hume's next major argument (Section VII) investigates our very notion of causation, concluding that so far from having anything to do with insight into the world, it instead involves a projection onto the world of our own inferential behaviour. This might seem to imply dismal prospects for science, but Hume turns it to advantage

by insisting on the moral that causation—*genuine* causation—is to be understood in conformity with his analysis, and he ends the section by defining 'cause' accordingly. Intelligibility is not to be had, *but nor is it required*, and the proper ideal of science is rather to discover and simplify the laws that describe phenomena (*E* 4.12). Thus *all* causes in science can, and should, be viewed broadly instrumentally, as Newton had done in the case of gravity and Berkeley generalized. This positive message is developed further in Section VIII, where Hume follows Hobbes in advocating a deterministic compatibilism. His new understanding of causation significantly strengthens the case, by showing that a lack of 'intelligibility' in the moral world is no obstacle to genuine causation or determinism concerning human action. Thus moral science—as exemplified in numerous of Hume's essays and other works—is shown to be feasible. He then goes on to attack the rational basis for belief in God (Sections X and XI), and to advocate a 'mitigated scepticism' which does not aspire to certainty, limits our scientific ambitions, and restricts them to subjects within the scope of our experience (Section XII).

From this perspective, both Darwinian biology and the development of science since the dawn of the twentieth century can be seen as vindicating Hume. Darwin emphasized our continuity with the animals, then relativity theory and quantum physics demonstrated conclusively that the apparent intelligibility of the world that so impressed philosophers from Aristotle to Descartes to Kant (and beyond) was largely an illusion. As a result, the rigorously empiricist and methodologically instrumentalist approach that Hume pioneered has become scientifically mainstream, and in this respect the *Enquiry* may today seem relatively innocuous and inoffensive. However, it still has much to teach even modern scientists, who will often stop applying their critical methods outside the laboratory, whereas Hume would advise that we take them more seriously, into the religious and moral assumptions that drive our lives. To better appreciate the force and implications of all this, let us now turn in more detail to the *Enquiry* itself.

8. *Section I: The Aims of the* Enquiry

The first section of the *Enquiry* serves as an introduction, but starts out as a comparison between two species of 'moral philosophy' (i.e. the

study of man).[16] The 'easy philosophy' is eloquent and poetic, using immediately striking, easily comprehensible, and imaginatively pleasing reflections on life to paint virtue in alluring colours and thus to improve our manners and behaviour. By contrast, 'abstruse' philosophy aims to satisfy the intellect rather than to please the imagination—its goal is to discover the actual principles of human nature by systematic rational investigation. Initially Hume gives the appearance of preferring the easy philosophy (*E* 1.3–6) as more agreeable and down to earth, but in fact most of the section is devoted to a defence of abstruse metaphysics, spelling out 'what can reasonably be pleaded in their behalf' (*E* 1.7).

Hume's defence of abstruse metaphysics combines two main themes which might be described as the *scientific* and the *critical*. The former highlights the necessity and value of careful, precise thinking in establishing general truths about man and the moral world; thus the abstruse philosophy can help the easy, in much the same way as an anatomist can help a painter, as well as fostering the innocent pleasure of discovery. The main objection to this optimistic picture is that such potential discovery of truth is an illusion, and it is in response to this objection that the critical theme comes to the fore:

> Here indeed lies the justest and most plausible objection against a considerable part of metaphysics, that they are not properly a science; but arise either from the fruitless efforts of human vanity, which would penetrate into subjects utterly inaccessible to the understanding, or from the craft of popular superstitions, which, being unable to defend themselves on fair ground, raise these intangling brambles to cover and protect their weakness. . . .
>
> But is this a sufficient reason, why philosophers should desist from such researches . . . ? Is it not proper to draw an opposite conclusion . . . ? . . . The only method of freeing learning . . . from these abstruse questions, is to enquire seriously into the nature of human understanding, and shew, from an exact analysis of its powers and capacity, that it is by no means fitted for such remote and abstruse subjects. We . . . must cultivate true metaphysics with some care, in order to destroy the false and adulterate. . . . Accurate and just reasoning . . . is alone able to subvert that abstruse philosophy and metaphysical jargon, which, being mixed up with popular superstition . . . gives it the air of science and wisdom. (*E* 1.11–12)

[16] Here 'moral philosophy' is used in its 18th-century sense, rather than in the modern sense of *ethics*. Note again that unfamiliar or antiquated terms can be consulted in the Glossary below.

His critical salvo delivered, Hume soon turns back to his scientific theme, emphasizing the 'many positive advantages, which result from an accurate scrutiny into the powers and faculties of human nature'. It might be suggested that any such supposed 'science is uncertain and chimerical', but Hume responds to this suggestion by insisting that at least some kind of 'mental geography, or delineation of the distinct parts and powers of the mind' is clearly defensible and well within our grasp (*E* 1.13–14). Moreover our scientific ambitions can legitimately extend deeper than this mere 'ordering and distinguishing [of] the operations of the mind':

> May we not hope, that philosophy, if cultivated with care . . . may carry its researches still farther, and discover, at least in some degree, the secret springs and principles, by which the human mind is actuated in its operations? (*E* 1.15)

Just as Brahe, Kepler, and others, by 'ordering and distinguishing' the apparent motions of the planets, had prepared the way for Newton to build on their work and reveal the hidden laws underlying such motion, so philosophers—having established a reliable mental geography—can then aspire to uncover the secret springs and principles that generate the observable behaviour of the mind.

9. *Sections II and III: The Origin and Association of Ideas*

Section II of the *Enquiry* sets out the basic principles of Hume's 'Theory of Ideas', most of which is derivative from Locke's *Essay concerning Human Understanding*. It is perhaps due to the influence of Locke's attack on innatism (cf. §3 above) that the origin of ideas is given such a prominent position by Hume, but this emphasis is rather misleading, for it plays an important role only in one later section of the *Enquiry* (Section VII), and even here in Section II Hume's explicit discussion of the innate ideas controversy merits only a note (*E* 2.9 endnote [A]).

Ideas and Impressions

Locke, like Descartes, had used the vague word 'idea' for 'whatsoever is the object of the understanding when a man thinks' (*Essay*, I. i. 8). Thus according to Locke, anyone who sees the blue sky or feels a pain has in his mind an idea of that colour or of that sensation, and

likewise anyone who merely thinks about the sky or contemplates pain also has in his mind corresponding ideas. Hume, however, considers this broad usage to be inappropriate, for it conflates together two quite distinct mental operations—namely the awareness of sensations or feelings, and the consideration of thoughts—and only the latter, in his opinion, can properly be called 'ideas' in the conventional sense. He therefore restricts the scope of 'idea' to refer to thoughts alone, coining the new term 'impression' to refer to sensations and feelings, and the term 'perception' for the general class of objects of the mind, comprising impressions and ideas together (so Lockean 'ideas' become Humean 'perceptions'). In general, impressions are more 'forceful and vivacious' than ideas, though this rule can break down if 'the mind be disordered by disease or madness' (*E* 2.1): a madman's thoughts could be as vivid to him as his sensations, in which case he would presumably be unable to tell the difference.[17]

Some of Hume's discussion suggests a distinction (again derived from Locke) which he had defined explicitly in the *Treatise*:

> Simple perceptions or impressions and ideas are such as admit of no distinction nor separation. The complex are the contrary of these, and may be distinguished into parts. Tho' a particular colour, taste, and smell are qualities all united together in this apple,'tis easy to perceive they are not the same, but are at least distinguishable from each other. (*T* 1.1.1.2)

Presumably the particular ideas of colour, taste, etc. are understood to be simple ideas, while the idea of the apple is a complex idea that combines them, but in the *Enquiry* Hume gives no such clear examples of complexes composed of simples. Instead he gives two instances of complex ideas, namely that of a golden mountain and that of a virtuous horse, each itself composed of two further complex ideas (*E* 2.5). This might suggest that he no longer wishes to commit himself to a view about which ideas, if any, are absolutely simple, though he later hints that ideas of colour seem to be (*E* 2.8).

[17] 'Force' and 'vivacity' do not seem to be the best words to capture the distinction between sensory awareness or feelings on the one hand, and thoughts on the other, because thoughts can sometimes be very vivid (e.g. thinking about one's sweetheart, noticing a vital step in a winning chess combination), while sensations can be very dull and boring (e.g. watching paint dry). Fortunately, very little in the *Enquiry* depends on exactly how 'force and vivacity' is interpreted.

The Copy Principle

Hume argues that although our capacity to form ideas may seem completely unbounded, in fact 'all this creative power of the mind amounts to no more than the faculty of compounding, transposing, augmenting, or diminishing the materials afforded us by the senses and experience' (*E* 2.5).[18] In other words, our minds can create new ideas from the components which experience has already given us, by combining together our existing ideas in new ways or by shuffling the components of our existing ideas, but we are quite unable to form any completely new ideas beyond those that have already been given to us by sensation or feeling.

> Or, to express myself in philosophical language, all our ideas or more feeble perceptions are copies of our impressions or more lively ones. (*E* 2.5)

This is widely known as Hume's *Copy Principle*.[19]

Hume gives two arguments (*E* 2.6, 2.7) for the Copy Principle, the first of which simply claims that all of our existing ideas, if examined, will in fact turn out to be copied from impressions. Here the example he gives is deliberately chosen to oppose Descartes:

> The idea of God, as meaning *an infinitely intelligent, wise, and good Being*, arises from reflecting on the operations of our own mind, and augmenting, without limit, those qualities of goodness and wisdom. (*E* 2.6, my italics)

Obviously the Cartesian could persist in claiming that the idea of God is innate, but Hume's rival account of the idea is straightforward and plausible, and carries force given the weight of his generalization. If all our ideas can be accounted for by the Copy Principle, then why should we suppose any mysterious faculty of innate ideas?

Hume ends Section II by suggesting that the Copy Principle provides a potent weapon for eliminating bogus would-be ideas that turn

[18] Hume's famous 'missing shade of blue' (*E* 2.8) highlights another way in which the mind might 'compound . . . the materials afforded us by the senses', by mixing ideas to generate intermediates. This casts doubt on the claim that all *simple* ideas must be direct copies of impressions, but it does not pose any sort of difficulty for his general claim that the materials of our thoughts must ultimately derive from impressions.

[19] Without the simple-complex distinction the principle is hard to express precisely (cf. *T* 1.1.1.7), because a complex idea (e.g. of a golden mountain) can perfectly well be formed without being copied from a single corresponding impression. The point is that every *part* of the idea must ultimately be copied from part of some impression—i.e. there is no part of the idea which is not impression-derived.

out to have no corresponding impression (*E* 2.9). However, in the rest of the *Enquiry* he uses it less aggressively, not to reject ideas but as a tool of analysis, a 'new microscope or species of optics' (*E* 7.4) which can make our ideas more clear and precise by discovering the impressions from which they are derived and of which they are copies.[20] As we shall see later, his main application of this 'microscope' comes in Section VII, where he uses it to clarify the idea of necessary connexion, but there are also brief hints of its playing a role in Section XII, as applied to the ideas of extension (*E* 12.15), space, and time (*E* 12.20 endnote [P]).

The Association of Ideas

The present Section III is merely the first three paragraphs of what was originally a much longer essay, which Hume cut down after the 1772 edition by the removal of an extended discussion of the role of the association of ideas in literature (see pp. 178–83). It is very straightforward, first pointing out that our ideas tend to follow each other, and to combine with each other, in regular patterns. He then suggests that all of this associative behaviour reduces to the operation of three relations or 'principles of connexion among ideas, namely, *Resemblance*, *Contiguity* in time or place, and *Cause* or *Effect*'. The section ends rather tamely, with Hume stating that although he can find no other principles of association besides these three, nevertheless he cannot prove that his enumeration is complete. This doesn't seem to be of great concern to him, presumably because nothing of great consequence hangs on it in what follows. Indeed the only significant role of the association of ideas in the *Enquiry* is to provide an analogy with the operation of *custom*. In Part ii of Section V (*E* 5.20), Hume will suggest that custom, an instinctive mechanism that underlies all of our factual reasoning, operates in a somewhat similar way to the association of ideas.

10. *Section IV: Hume's Fork*

In Section IV the serious business of the *Enquiry* begins, and Hume presents his most celebrated argument, the sceptical argument

[20] In the *Treatise* Hume had used the Copy Principle to dismiss a fair number of supposedly bogus ideas, for example material substance (*T* 1.1.6.1), existence (*T* 1.2.6.2–5), solidity (*T* 1.4.4.12–14), mental substance (*T* 1.4.5.3–4), and the self 'as something simple and individual' (*Appendix*, 11).

concerning what he calls 'reasoning concerning matter of fact', but we shall call 'factual reasoning' for short. First, however, there is a vital preliminary. In the first two paragraphs of Section IV, Hume introduces a distinction of enormous importance, between 'relations of ideas' and 'matters of fact' (a distinction commonly known as 'Hume's Fork'). Relations of ideas, as the name implies, can be known a priori, simply by inspecting the nature and internal relations between our ideas, and using either immediate 'intuition' (e.g. our direct intellectual grasp that one plus one equals two, or that a square has four sides) or 'demonstration' (i.e. a sequence of 'intuitive' steps, as for example in the proof of Pythagoras' Theorem). Such truths can therefore be known with complete certainty.

Matters of fact, by contrast, can be known only a posteriori (i.e. by consulting past experience), since they do not concern just the internal relations between our ideas, but rather how those ideas go together in the actual world (e.g. it is a matter of fact whether the idea of gold coexists 'externally' with the idea of a mountain, i.e. whether there is in fact a golden mountain). For this reason there is no internal contradiction in supposing any matter of fact to be otherwise—its falsehood is distinctly *conceivable*—and it follows that no matter of fact can be demonstrated a priori to be true. Thus no matter of fact is intuitively or demonstratively certain.

Here are some relatively straightforward examples of the two sides of Hume's distinction:

Relations of Ideas	Pythagoras' Theorem (*E* 4.1)
	$3 \times 5 = \frac{1}{2} \times 30$ (*E* 4.1)
	All bachelors are unmarried
	A metre contains 100 centimetres
Matters of Fact	The sun will rise tomorrow (*E* 4.2)
	The sun will not rise tomorrow (*E* 4.2)
	Stones fall when released in air
	Impact causes a billiard ball to move

Note that although relations of ideas are a priori, and in *this* sense prior to experience, it does not follow that the ideas they involve are 'innate' and in *that* sense prior to experience. On Hume's principles the idea of a bachelor, like all other ideas, is derived from experience

(e.g. a baby wouldn't have the idea): the point is that *having acquired that idea* I can then know for certain, without any empirical investigation, that all bachelors are unmarried. What makes a truth a priori is that it can be *justified* without appeal to experience, purely by thinking about the ideas involved. Matters of fact, by contrast, can be known to be true (or to be false) only by consulting experience.

Demonstrative and Factual Reasoning

A little later in Section IV, Hume draws a related distinction between types of *reasoning*, though he does not spend long explaining it, perhaps because it was already very familiar from the work of John Locke:

> 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. (*E* 4.18)

Demonstrative reasoning is what can be loosely called 'deductive' reasoning,[21] in which the steps of the argument proceed with absolute certainty based on the logical relations between the ideas concerned (e.g. the kind of argument used in mathematics, such as the proof of Pythagoras' Theorem). *Factual* reasoning—which Hume also calls 'moral' and Locke had called 'probable'—is now commonly called 'inductive' inference, encompassing all sorts of everyday reasoning in which we draw apparently reasonable (but less than logically certain) conclusions based on our personal experience, testimony, our understanding of how people and things behave, and so forth.[22]

11. *Sections IV and V: The Basis of Factual Reasoning*

Hume's Fork raises the question of how we can know 'matters of fact' that go beyond our immediate experience of sensation and memory (*E* 4.3). It is in response to this enquiry that Hume develops his

[21] Taking 'deductive' here in an *informal* sense, rather than the stricter alternative modern notion which limits it to reasoning within a formal system.

[22] In this very general sense 'induction' is not confined—as the term's Aristotelian origins would suggest—to inferences that move from particular observations (e.g. of many *A*s that are *B*s) to a universal conclusion (e.g. that *all A*s are *B*s); indeed Hume's own examples are usually of particular inferences (e.g. that all observed *A*s have been *B*s, therefore *this A* is *B*). The term is not used by Hume himself in either sense.

argument concerning induction, probably the most famous argument in English language philosophy.

The Sceptical Argument Concerning Induction

Suppose I see one loose billiard ball collide with another. I will naturally expect the second ball to move, but how can I know—or even have any ground for reasonable belief—that it will do so? Hume starts by pointing out that any such belief about the unobserved appears to be based on *causation*: I predict that the second ball will move on the basis of a belief that the collision will *cause* it to do so. Where, then, do such causal beliefs come from? Apparently only from experience, because they cannot be known a priori, a point on which Hume expands at length (*E* 4.6–11). But to learn anything from experience, we must clearly be able to extrapolate beyond it: to draw factual or inductive inferences from what we *have* observed, to what we have *not* (as when we infer that hitherto unobserved billiard balls will behave in the same sorts of ways as those we have experienced, and that the operative causal laws will remain consistent). It follows that all our beliefs about unobserved matters of fact are based on a general principle or supposition of uniformity, *that the future will resemble, or be conformable to, the past* (*E* 4.19, 4.21), and they can be warranted only if this is rationally well founded. The challenge is to identify any such rational foundation:

> if you insist, that the inference [from observed to unobserved] is made by a chain of reasoning, I desire you to produce that reasoning. (*E* 4.16)

Hume therefore turns to examine all the potential sources of rational justification for this principle of uniformity. A passage from *A Letter from a Gentleman to his Friend in Edinburgh* (1745), written at about the same time as the *Enquiry*, helps to explain his procedure in what follows:

> It is common for Philosophers to distinguish the Kinds of Evidence into *intuitive*, *demonstrative*, *sensible* [i.e. sensory], and *moral* [i.e. inductive]; (*L* 22)

Hume accordingly points out that his uniformity principle cannot be based on rational 'intuition', nor on 'demonstrative argument' from our experience, because we can easily conceive of the future's turning out differently (*E* 4.18). Nor can it be founded on anything that we learn by sensory experience, since this tells us nothing about objects'

underlying powers—we learn what powers things have only through practical experience of their effects, not by any perception of their nature (*E* 4.16, 4.21). All this leaves only 'moral' (factual or inductive) argument from experience, but even if experience might reliably tell us what powers objects have had in the past, it cannot justify any inference *beyond* that past experience, except by taking for granted the principle that we are trying to establish, which would be viciously circular (*E* 4.19). Having thus ruled out intuition, demonstration, sensation, and factual inference, the upshot is that *none* of these conventionally accepted sources of evidence can provide any foundation for the principle of uniformity. Hence, Hume concludes, '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' (*E* 4.23). It seems, then, that we can give no solid rational basis whatever for our only method of establishing matters of fact 'beyond the present testimony of our senses, or the records of our memory', and this result is Hume's famous scepticism about induction.

Custom and Belief

Section V of the *Enquiry* starts with a paragraph commending philosophical scepticism, strongly contrasting with the typical view of the time which saw the sceptic as a dangerous enemy of religion and morality.[23] In opposition to this view, Hume goes on to stress that theoretical sceptical doubts, even if founded on impeccable philosophical argument, cannot in practice undermine our natural human tendency to draw inferences and form beliefs:

> Though we should conclude . . . 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 (*E* 5.2)

[23] Hume's *Letter from a Gentleman*, quoted in the previous paragraph, was written to defend himself against a vitriolic pamphlet which had accused him of 'Universal Scepticism . . . downright Atheism . . . denying the Immateriality of the Soul . . . sapping the Foundations of Morality' (*L* 17–18).

Hume calls this principle of factual inference *custom* or *habit*, emphasizing its vital role as 'the great guide of human life', without which 'we should be entirely ignorant of every matter of fact, beyond what is immediately present to the memory and senses' (*E* 5.6). Custom provides an answer to the sceptical doubts that Hume has raised not by addressing them, but by ignoring them. It irresistibly leads us to make inferences from observed to unobserved immediately, instinctively, and without reflection, but since these inferences are not founded on reason, they are also immune to scepticism about reason (*E* 5.8). All this might seem to make Hume an irrationalist, committed to denying any criteria for reasonable belief and to accepting the equal legitimacy of any inference that seems natural. But as we shall see later, this is very far from being the case.

Part ii of Section V discusses the nature of belief, though Hume indicates that this discussion is not central to his views, and 'may . . . be neglected' without great loss (*E* 5.9). Whereas Part i seems to be an exercise in what Section I called 'mental geography', identifying custom as one of the central 'powers and faculties' of the human mind (*E* 1.14), Part ii seems to provide a cautious sketch of the kind of deeper study of 'secret springs and principles' (*E* 1.15) that Hume had also anticipated, speculating about the underlying basis of custom's operation. The main conclusion of this study is simply that custom is somewhat analogous to the association of ideas explained in Section III (*E* 5.20). It therefore provides an illustration of how the science of the human mind can proceed, aiming 'to reduce the principles' that govern it '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' (*E* 4.12). Hume has already argued that this sort of systematization is 'the utmost effort of human reason', and is the most that science can aspire to, given the impossibility of achieving a priori insight into why things operate as they do. Section V Part ii thus provides a brief illustration of Hume's general philosophy of science, applied to the study of the human mind.

12. *Section VI: 'Of Probability'*

As we saw earlier in Section IV, Hume took over from Locke (*Essay*, IV. xv. 1) a general distinction between *demonstrative* and *probable* reasoning, though he generally prefers to call the latter 'moral reasoning',

or 'reasoning concerning matter of fact and existence'. On Locke's account, no reasoning from past to future can be more than 'probable', even if it is based on extensive and totally uniform experience (as for example when I predict that an unsupported stone, when released above the ground, will fall). Hume begins Section VI with an important footnote in which he suggests a refinement of Locke's terminology, coining the term 'proof' for these most strongly grounded experiential inferences, and reserving the word 'probability' for inferences in which past experience is less than uniform. Here he is not, of course, retracting anything in his previous argument: what he now calls 'proofs' are still based on instinct rather than on rational insight, but he is pointing out that it seems unnatural to call a conclusion such as *that all men will die* merely 'probable', since our entirely uniform experience in its favour is psychologically entirely compelling, leaving 'no room for doubt'.

Section VI aims to provide a brief explanation of 'probability' in Hume's new narrower sense, showing how the mechanism of causal inference discovered in Section V can be extended to account for our tendency to form beliefs of different degrees of conviction in proportion to mixed evidence. Such an account advances his proposed science of mind, by 'resolving' another form of reasoning into an already identified 'general cause' (cf. *E* 4.12), namely *custom*. Custom typically leads our minds to make associative links whose strength is in proportion to the balance of evidence, and this can explain both the 'probability of chances' (e.g. predicting the falls of a six-sided die) and the 'probability of causes' (e.g. predicting that the next *A* will be a *B* on the grounds that most, but not all, past *A*s have been *B*s, though the underlying causes are unknown).

Hume will later apply this account to the case of miracles in Section X, where it turns out that he intends it to be not only explanatory of how we *do* reason, but also *normative*: prescribing how we *should* reason. His basis for this is not made entirely explicit, but the underlying motive seems to be the *legitimation* of probabilistic reasoning, conferring it with authority and respectability, by showing it to be derivative from a principle which plays such an essential and irresistible role in our mental life. From now on, one of Hume's main aims in the *Enquiry*—and arguably his primary aim—will be to spell out the implications of systematically taking custom, and custom alone, as our touchstone of empirical rationality.

13. *Section VII: 'Of the Idea of Necessary Connexion'*

Hume starts Section VII by emphasizing the importance of clarifying our philosophical ideas, focusing particularly on 'those of *power*, *force*, *energy*, or *necessary connexion*' (*E* 7.3) which are so intimately connected with the vital concept of *causation*, itself the basis of all reasoning from experience (as we saw in Section IV). Hume's method of clarifying obscure ideas is to make use of the 'new microscope or species of optics' (*E* 7.4) which the Copy Principle of Section II provides, by inspecting the impression(s) from which those ideas are derived. Thus begins the hunt for the impression of necessary connexion.[24]

PART I: A Fruitless Search

Hume begins with his favourite example of the two billiard balls. We see one billiard ball striking another, see the second one move, no doubt hear a sound; but what we do not perceive in any way through the senses is the *necessity* that we assume connects the two events together (in that the one event *had to be* followed by the other). All we see is a sequence of events—we do not see the causal glue that (we assume) binds them, or the *power* in the one ball's movement by which it communicates motion to the other.

Hume proceeds to back up this claim with an important argument, several variations on which will be used in the pages to come:

> From the first appearance of an object, we never can conjecture what effect will result from it. But were the power or energy of any cause discoverable by the mind, we could foresee the effect, even without experience; and might, at first, pronounce with certainty concerning it, by the mere dint of thought and reasoning. (*E* 7.7)

This builds on the sceptical argument of Section IV Part i, which established that all causal knowledge is a posteriori, that nothing about causes and effects can be known in advance of experience.

[24] Hume consistently treats 'power' and 'necessary connexion' as equivalent, sometimes abbreviates the latter to just 'connexion' (*E* 7.28), and also equates these with other terms such as 'force' and 'energy'. This suggests that the key idea whose source he is seeking is not strictly that of *necessary* connexion, but rather the wider notion of *connexion* in general, or a *consequential* link from one thing to another. This also fits with his view, implied by Section VI, that the notion of probability is derived from the same source.

If we perceived an impression of necessary connexion between *A* and *B*, he reasons, *then* we could know a priori that *A* causes *B*. But we cannot know a priori that *A* causes *B*. So it follows that we perceive no such impression of their necessary connexion.

Having ruled out any sensory source for the impression of necessary connexion, Hume moves on to consider the possibility that it might instead be an impression of reflection acquired from our awareness of the mind's powers, or consciousness of the actions of our will (*E* 7.9–20). But he denies that this can be so, using the same style of argument. He examines the operation of our will first in moving our body (*E* 7.10–15), and then in forming and processing ideas (*E* 7.16–20), emphasizing how both types of power can be known only by experience.

Hume then takes time off from his search for the impression of necessity, to mount a vigorous attack upon Malebranche's doctrine of *occasionalism* (explained in §6, above). Malebranche had used arguments somewhat similar to Hume's, to maintain that we have no idea of power in objects, and he concluded that only God can exert genuine power. Hume starts his critique by mischievously suggesting that occasionalism has superstitious origins (*E* 7.21). He then dismisses it with two characteristic objections (*E* 7.24–5), first, that it is too bold and bizarre to be credible (cf. *E* 12.25), and secondly, that it is inconsistent, since the same reasoning that the occasionalists use to show that power in objects is inconceivable shows equally that power in minds, even in a divine mind, is also inconceivable.

Although Hume's hunt for the elusive impression of necessary connexion has so far been in vain, his arguments of Section VII Part i have succeeded in other ways. He has attacked the foundation of Cartesian science, based as it is on the ideal of clear and distinct perception of nature's workings, by denying outright that any causal interactions at all—even those of God—are in any way 'intelligible'. We cannot 'understand' how billiard balls communicate motion by impulse, nor how the mind has command over the body, nor even how any mind, whether human or divine, has command over itself. And the fact that we cannot understand these operations proves that we cannot perceive the necessity which supposedly governs them. All are equally unintelligible, equally opaque to 'clear and distinct' perception.

PART II: Cause Successfully Defined

The first paragraph of Part ii provides a useful summary of Part i, pointing towards the sceptical conclusion that the idea of necessary connexion is entirely bogus and the term meaningless. But Hume then suggests an alternative which proves to be more fruitful. Perhaps the impression of necessary connexion is not one that we perceive in *particular* instances of causal interactions (whether these be external or internal, physical or mental), but is instead an impression that arises *from repetition* when it leads us, through the operation of custom, to make causal inferences:

> This connexion, therefore, which we *feel* in the mind, this customary transition of the imagination from one object to its usual attendant, is the sentiment or impression, from which we form the idea of power or necessary connexion. (*E* 7.28)

Thus the idea of necessary connexion is derived from our own awareness of making causal inferences. Having seen *A* and *B* constantly conjoined in the past, when we see an *A*, we just find ourselves expecting a *B*, and we are aware of having made this transition of thought or inference. It is the inference itself that then gives content to our idea of connexion, 'that inference of the understanding, which is the only connexion, that we can have any comprehension of' (*E* 8.25). When we say that *A* is the cause of *B*, we naturally think of this causal link—this supposed necessary connexion—as the basis of our inference from *A* to *B*. But the central core of Hume's message is that *this is the wrong way round*: it is our tendency to infer *B* from *A* that gives content to the causal claim, and so, as he put it in the *Treatise*, 'the necessary connexion depends on the inference, instead of the inference's depending on the necessary connexion' (*T* 1.3.6.3).

The idea of necessary connexion has now been vindicated as a bona fide idea, but shown to be copied from something internal, which Hume—in line with his Copy Principle—calls an 'impression', but which would perhaps be more accurately described as a reflexive awareness of our own inferential behaviour. It seems to follow that we have no real idea of any sort of 'power' or 'necessity' that might be supposed to reside in objects, leading Hume to his famous—indeed notorious—subjectivist conclusion about necessity and hence causation:

> When we say, therefore, that one object is connected with another, we mean only, that they have acquired a connexion in our thought (*E* 7.28)

> The necessity of any action, whether of matter or of mind, is not, properly speaking, a quality in the agent, but in any thinking or intelligent being, who may consider the action. (*E* 8.22 endnote [F])

Some recent interpreters have cast doubt on the extent to which passages such as these reflect a genuine subjectivism on Hume's part.[25] But in terms of its influence on epistemology, metaphysics, and the philosophy of science, this 'anti-realism' about causation, along with his inductive scepticism, constitutes his most prominent legacy.

Having finally tracked down the impression of necessary connexion, Hume sets about clarifying the notion of 'cause', of which necessary connexion is the central component. He gives two 'definitions of *cause*', also adding a gloss on the first of them:

> [1] *an object, followed by another,*[26] *and where all the objects, similar to the first, are followed by objects similar to the second.*
>
> Or in other words
>
> [1′] *where, if the first object had not been, the second never had existed.*[27]
>
> [2] *an object followed by another, and whose appearance always conveys the thought to that other.* (*E* 7.29)

Since Hume has already argued that the idea of necessity cannot literally be *defined* in the sense of a conceptual analysis or dictionary definition (i.e. through 'enumeration of those parts . . . that compose' the idea, *E* 7.4), his two definitions must be understood as doing something rather different. They seem to be intended to capture the circumstances under which we come to ascribe causal connexion, with the first definition focusing on the kind of observation that leads someone to believe in such a connexion (namely, the observation of what appears to that person to be a constant conjunction), while the second definition focuses instead on what the student of human

[25] The main contributions to this ongoing debate are most easily accessible in Rupert Read and Kenneth A. Richman (eds.), *The New Hume Debate* (Routledge, 2nd edn., 2007), to which I have also contributed an essay.

[26] In the *Treatise* (*T* 1.3.14.31), Hume had insisted that a cause must be contiguous with its effect as well as temporally prior, but he dropped this condition from the *Enquiry* (cf. p. 207), presumably to allow for the possibility of gravitational action at a distance, or perhaps causation between mental events that have no spatial location.

[27] This gloss cannot possibly be equivalent to (1) even if it is interpreted as a straightforward past tense conditional, meaning 'where, if the first object *was not*, the second *was not* either'. Definition (1) states that the first object has never appeared without the second, which implies that if the *second* object was not, the *first* was not either. So Hume's gloss is puzzling, seeming to get things the wrong way round.

nature will observe in the believer once the causal belief has taken hold, and which gives that belief its characteristic content (namely, the operation of a certain type of associative mechanism). Hume acknowledges that his definitions fall short of what might be wished for: neither of them identifies anything about the specific cause in itself that connects it with its effect, for it is only in virtue of the *pattern of events*—the conjunction in other instances, or the consequent tendency to draw inferences—that the causal link can be ascribed. We are naturally inclined to want more, to try to grasp 'that circumstance in the cause, which gives it a connexion with its effect'. But on Hume's subjectivist principles, even this wish is incoherent: 'We have no idea of this connexion; nor even any distinct notion what it is we desire to know, when we endeavour at a conception of it' (*E* 7.29). So Hume's two definitions capture everything that we can coherently mean in ascribing causal connexions. Though we hanker after a deeper and more substantial conception of causation, some notion of the supposed causal glue that binds events together, we cannot achieve this, nor even any coherent understanding of what it is that we thus seek! This does not, however, undermine the notion of 'cause'; rather, it shows that the notion is to be ascribed purely on the basis of Hume's two definitions (cf. *T* 1.4.5.32).

14. *Section VIII: 'Of Liberty and Necessity'*

In Section VIII Hume pursues 'a reconciling project' (*E* 8.23), presenting a *compatibilist* solution to the ancient problem of free will and determinism. As briefly discussed in §4, above, he follows Hobbes in claiming that *the doctrine of necessity*—i.e. universal determinism—is compatible with *the doctrine of liberty*—i.e. the claim that some of our actions are *free* and therefore morally accountable. Hobbes had based his compatibilism on a definition of 'freedom' as being *able to do what one wills without hindrance*, and Hume's definition of 'liberty' is in the same spirit:

> By liberty, then, we can only mean *a power of acting or not acting, according to the determinations of the will*; that is, if we chuse to remain at rest, we may; if we chuse to move, we also may. (*E* 8.23)

Liberty so defined is obviously compatible with determinism: if our actions follow our will, then we do have such liberty, even if our will

itself is entirely causally determined. Hobbes had maintained that our will is indeed thus determined, and Hume agrees, but his distinctive contribution to the debate is to provide a new argument for this claim, appealing to the understanding of 'necessity' reached in Section VII:

> Our idea . . . of necessity and causation arises entirely from the uniformity, observable in the operations of nature; where similar objects are constantly conjoined together, and the mind is determined by custom to infer the one from the appearance of the other. . . . Beyond the constant *conjunction* of similar objects, and the consequent *inference* from one to the other, we have no notion of any necessity, or connexion. (*E* 8.5)

Most of Part i of Section VIII is devoted to making the case that human actions manifest such uniformity, that they are generally recognized as doing so, and that people standardly perform inductive inferences accordingly. Hence 'all mankind . . . have . . . acknowledged the doctrine of necessity, in their whole practice and reasoning', even while 'profess[ing] the contrary opinion' (*E* 8.21). Hume attributes this mismatch to men's 'propensity to believe, that they penetrate farther into the powers of nature, and perceive something like a necessary connexion between the cause and the effect'. Such penetration is, of course, an illusion (as shown in Sections IV and VII), and it is this recognition that provides the key to properly understanding the necessity of human actions. In learning that the necessity of *physical* operations amounts to no more than constant conjunction and consequent inference, we come to see that *human* actions too are subject to the same necessity.

While making this case, Hume in passing develops his view of inductive science, as sketched earlier in Section IV (*E* 4.12). We should look for causal relations that are entirely constant (*E* 8.13), seeking for deeper laws that underlie superficial irregularities. And we should do this not only in natural philosophy but in the human realm also, with equal expectation of success.

In Part ii of Section VIII, Hume turns to address the consequences of his determinist world-view for morality and religion. He starts (*E* 8.27) by re-emphasizing that his most distinctive contribution is to undermine the supposed metaphysical necessity of the *physical* world, rather than to propose any novel understanding of human action. He then goes on to argue for another distinctive claim (*E* 8.28–30): that

viewing human behaviour as causally determined, so far from being contrary to morality, is actually essential to it, since blame and punishment are appropriate only where actions are caused by the agent's durable character and disposition. This argument, however, even if accepted, does little to resolve the widely felt tension between determinism and moral responsibility: if everything that I do was 'pre-ordained' before I was even born, then how can I be *genuinely* responsible? It might now seem that the notion of moral responsibility has turned out to be incoherent, both requiring and yet being incompatible with determinism. Hume sketches his solution to this conundrum when discussing the religious implications of his views (*E* 8.34–5), a solution based on his moral theory which is *sentimentalist* (i.e. based on the emotions or passions) rather than *rationalist*:

> A man, who is robbed of a considerable sum; does he find his vexation for the loss any wise diminished by these sublime reflections? Why then should his moral resentment against the crime be supposed incompatible with them? (*E* 8.35)

If morality is founded on emotions of blame (etc.) that naturally arise within us in certain circumstances—for example when a crime is committed—then we should not expect that these emotions will disappear, just because we reflect on the inexorable chain of causation which led to the criminal's action. Here Hume does little more than drop this hint; the full development of his sentimentalist moral theory comes in the companion work, his *Enquiry concerning the Principles of Morals*.

15. *Section IX: 'Of the Reason of Animals'*

In the wake of the Darwinian revolution, it is no surprise that there should be similarities between animal and human thinking, but in the eighteenth century the suggestion was potentially quite shocking.[28] Human reason was commonly thought to be quasi-divine or angelic rather than beastlike, a faculty expressing the essence of our unique immaterial soul, capable of providing transparent insight into the nature of things and operating quite independently of brute animal

[28] Darwin's notebooks of 1838–9 record that he read Hume's section on the reason of animals just at the time that he was developing his theory of evolution.

instincts. Perhaps for this reason Hume's discussion is quite short, and steers clear of the dangerous implications made explicit in his essay 'Of the Immortality of the Soul' (included in this volume as Appendix II).

The main point Hume emphasizes here is a corollary of his inductive approach to science: since all our factual reasonings are founded on an assumption of uniformity or resemblance, their strength can be expected to depend on the *degree* of resemblance involved. Though Hume illustrates this point by the analogy between humans and animals—appealing to the instinctive nature of animal reasoning to corroborate his claim (from Sections IV and V) that human reasoning is instinctive also—his methodological message is more general. This is, that reasoning from analogy is a natural extension of inference based on custom, just as probabilistic reasoning was shown to be in Section VI.

16. *Section X: 'Of Miracles'*

Though mainly concerned with miracles, Section X has a far wider significance, because here we see how Hume's theory of induction based on custom has a critical edge, helping us to weigh up conflicting evidence appropriately, particularly in the case of evidence from testimony. Hume starts (*E* 10.3–4) by recalling his account of probability from Section VI, making its normative implications very explicit:

> A wise man, therefore, proportions his belief to the evidence. . . . All probability, then, supposes an opposition of experiments and observations, where the one side is found to overbalance the other, and to produce a degree of evidence, proportioned to the superiority. (*E* 10.4)

He goes on to argue that this general principle should be applied equally in the case of testimony, hence the credit that we give to reports of witnesses should be proportioned to their experienced reliability. However experience indicates that the reliability of witnesses varies, depending on a number of factors such as 'the opposition of contrary testimony; . . . the character or number of the witnesses; . . . the manner of their delivering their testimony; or . . . the union of all these circumstances' (*E* 10.7). These are all factors that we naturally—and rightly—take into account when assessing the overall credibility of testimony, which will depend in each case on the balance between the positive and negative factors involved.

Hume's main point in Part i of Section X is that there is another factor to put into this balancing operation, which does not depend on the nature of the *witnesses*, but rather, on the nature of the *reported event*. If this supposed event is quite contrary to our uniform experience or even apparently miraculous, then that experience itself provides strong inductive evidence against the event's occurrence.[29] Hence in assessing the overall credibility of the testimony, we must balance whatever experience we might have in favour of the reliability of the witnesses, against this contrary evidence:

> The plain consequence is (and it is a general maxim worthy of our attention), 'That no testimony is sufficient to establish a miracle, unless the testimony be of such a kind, that its falsehood would be more miraculous, than the fact, which it endeavours to establish: And even in that case, there is a mutual destruction of arguments, and the superior only gives us an assurance suitable to that degree of force, which remains, after deducting the inferior.' (*E* 10.13)

Hume can here be seen as anticipating a result that is now very familiar to theoreticians, but all too often ignored more widely: that when assessing the evidence for some event, it is important to take into account the *background probability* of the event itself.[30]

Hume's 'general maxim' sets a demanding requirement for testimony to establish a miracle. Then in Part ii, he gives four arguments to suggest that this requirement is, in practice, never likely to be satisfied, especially in the case of miracles associated with a religion. First, no miracle in history has in fact been sufficiently well attested by sufficiently many reliable witnesses (*E* 10.15). Secondly, the pleasant passion of surprise and wonder makes miracle stories particularly

[29] As we saw above in Section VI, Hume coins the term 'proof' for this strongest type of inductive argument, based on totally uniform experience. However, such proofs are not necessarily irresistible, and his discussion of miracles makes very clear that they can differ in strength and potentially conflict (see also his letter at p. 165, below).

[30] Suppose, for example, that I am worried about a genetic disease that afflicts one in a million people, and take a test for it which has a 99.9% chance of giving the 'correct' result (i.e. if I have the disease, it is 99.9% likely to come out positive, and if I don't, it is only 0.1% likely to come out positive). Most people would naturally take a positive result as showing that I very probably have the disease. However the one in a million 'background probability' outweighs the one in a thousand chance of the test's getting it wrong, leaving an overall probability that I have the disease, based on this evidence, of only 1 in 1,002. Thus a false test is far more likely than the disease itself.

prone to invention and fantasy, all the more so if they are propagated to promote religion (*E* 10.16–19). As the history of forged miracles amply demonstrates, a religious person may lie 'for the sake of promoting so holy a cause', or out of vanity, or he may be gullible or swayed by eloquence (since many renounce their reason in questions of religion). Thirdly, miracle stories almost all 'abound amongst ignorant and barbarous nations', suggesting that they are indeed products of imagination rather than provable fact (*E* 10.20–3). Finally, if a miracle is supposed to establish the religion (or sect) to which it is attributed, and since the various religions are incompatible, it follows that the evidence for any miracle will be opposed by the evidence in favour of the far greater number of miracles reported in other religions. Hume illustrates this point (*E* 10.25–7) with some apparently well-evidenced miracles that he is confident his readers will reject, thus suggesting that the dismissive attitude they naturally feel towards miracles associated with the Roman emperor Vespasian (for example) should equally be extended to the Christian miracles they are inclined to accept.

Putting all these points together, 'Upon the whole . . . it appears, that no testimony for any kind of miracle has ever amounted to a probability, much less to a proof'. Moreover because of the distinctive tendency of religions to propagate bogus miracle stories and to generate fanciful testimony for them, 'no human testimony can have such force as to prove a miracle, and make it a just foundation for any [popular] system of religion' (*E* 10.35). Outside a religious context, there *could* conceivably be sufficient evidence for some kinds of miracles (though perhaps not for a resurrection—*E* 10.37), but if a miracle 'be ascribed to any new system of religion, . . . this very circumstance would be a full proof of a cheat' (*E* 10.38). 'Proof' here does not imply that religious miracles are logically impossible (cf. n. 29, above); it is simply that our extensive experience of the hopeless unreliability of religiously inspired miracle stories counts decisively against their credibility. An omnipotent deity *could*, of course, bring about whatever the stories report. But even if God exists, experience remains our only guide to His ways of working, and hence in assessing the stories we are still reduced to comparing the reliability of testimony with the reliability of the apparent laws of nature (*E* 10.38). Even for the theist, custom and induction provide the only route to factual discovery.

17. *Section XI: 'Of a Particular Providence, and of a Future State'*

Most of the argument of Section XI is put in the mouth of 'a friend who loves sceptical paradoxes', and placed in a classical context, to enable Hume to distance himself from his controversial critique of the Design Argument for a Christian God, which when he wrote was the most respected weapon in the theist's arsenal (cf. §5, above). Hume's main point against that argument is that it can never prove the existence of a being with more impressive qualities (e.g. power, wisdom, or goodness) than are actually manifested in the world. So we can never argue first from the world to God, and then back from the nature of that inferred God to draw *new* conclusions about the world—for example that there is an afterlife in which the good will be rewarded and the evil punished.

Just as in Section X, therefore, Hume is working out the implications of basing our knowledge of the world on induction. 'Experimental theists' claim to provide a solid rational foundation for their belief in God, based not on speculative metaphysics, nor on special divine revelation, but on the relatively down-to-earth methods of inductive science, reasonably 'drawing inferences from effects to causes'.[31] Hume counters that

> they have aided the ascent of reason by the wings of imagination; otherwise they could not thus change their manner of inference, and argue from causes to effects; presuming, that a more perfect production than the present world would be more suitable to such perfect beings as the gods, and forgetting that they have no reason to ascribe to these celestial beings any perfection or any attribute, but what can be found in the present world. (*E* 11.16)

Again Hume attacks a theistic argument, and in doing so uses—and highlights—principles that are of far broader application. As well as this principle of *proportionality*, that we should proportion hypothesized causes to their observed effects, Section XI also re-emphasizes the principle of *analogy* from Section IX, that an inductive argument's strength varies with the degree of similarity between the objects involved, so that any inference from human purposes to those

[31] In the excerpt from Hume's *Dialogues* (see Appendix III), Cleanthes expresses this preference very clearly. It is instructive to read Section XI of the *Enquiry* alongside both the *Dialogues* and the essay 'Of the Immortality of the Soul' (see Appendix II).

of a god is bound to be weak (*E* 11.25–7). Hume also hints at two other general principles, that it is problematic to draw conclusions about any supposed cause that is known only through a single manifestation (*E* 11.25–6), and—even more so—any supposed cause of a unique type (*E* 11.30).

18. *Section XII: 'Of the Academical or Sceptical Philosophy'*

In Section XII, Hume discusses a wide array of sceptical arguments, clarifying his own finely balanced attitude to them. While acknowledging many of them to be irrefutable, he nevertheless resists, on practical rather than purely theoretical grounds, being forced by them into 'excessive' scepticism. This approach is typified by his short treatment of *antecedent* scepticism at *E* 12.3–4, where he contrasts the futile and self-defeating extremes of Cartesian doubt with a more moderate caution and modesty that he fully endorses.[32] He then moves on to discuss several varieties of *consequent* scepticism—scepticism arising from specific considerations rather than generalized a priori distrust of our faculties—and these occupy most of Part i and all of Part ii.

Turning first to our sensory belief in the external world, Hume attributes this to a 'blind and powerful instinct of nature' (*E* 12.8), which, however, leads us to identify physical objects with the very images that appear to our minds. This identification raises obvious problems, because the perceptions of the mind are so fleeting (*E* 12.9); hence to maintain our instinctive belief in a durable external world, modern philosophers such as Locke adopt the theory of *representative realism*: postulating physical objects that are distinct from, and causes of, those perceptions. Drawing on his theory of causation, Hume now emphasizes the impossibility of establishing any such theory. If we are only ever directly acquainted with our perceptions, and never with their supposed causes, then no connexion between the two—no 'constant conjunction' (cf. *E* 7.28, 8.5)—can ever be observed. Even worse, an argument derived from Berkeley (*E* 12.15) suggests that the Lockean theory is not only groundless but vacuous or incoherent.

[32] Descartes used extreme scepticism as a tool for sweeping away traditional views, and claimed to establish his own first principles as 'clearly and distinctly perceived', supposedly immune even to the most radical doubt.

For Locke's understanding of perception depends on a distinction between *primary* and *secondary* qualities, where the former (e.g. length, movement, solidity) are supposed to be in the objects themselves in a way that resembles our ideas of them, while the latter (e.g. felt hardness, temperature, colour) are not. But Hume agrees with Berkeley that our ideas of primary qualities are entirely dependent on those of secondary qualities; for example we acquire an idea of an extended area by seeing it differently coloured from its surroundings. Hence if we try to imagine an external object as independent of our perceptions, distinct from all mind-dependent qualities, then we are forced to 'bereave matter of all its intelligible qualities, both primary and secondary', and we are left only with 'a certain unknown, inexplicable *something*, as the cause of our perceptions; a notion so imperfect, that no sceptic will think it worth while to contend against it' (*E* 12.16). One important upshot of this discussion is that any attempt to penetrate the essence of physical objects—so popular amongst theological metaphysicians intent on proving matter's inertness (cf. §6, above)—is doomed to failure.

Part ii of Section XII turns to scepticism about our reasoning faculties, starting with some of the notorious paradoxes of infinite divisibility. Hume describes and seems to endorse them, though in a note (*E* 12.20 endnote [P]) he suggests that it may be possible 'to avoid these absurdities and contradictions', by appeal to a non-abstractionist theory of general ideas (as developed more fully in *Treatise* 1.1.7). He then moves on to scepticism about factual reasoning, first dismissing—on practical grounds—an 'excessive' *popular* variant which takes our inconsistent judgements to undermine all inductive reasoning:

> The great subverter of *Pyrrhonism* or the excessive principles of scepticism, is action, and employment, and the occupations of common life. These principles may flourish and triumph in the schools; where it is, indeed difficult, if not impossible, to refute them. But as soon as they leave the shade, and by the presence of the real objects, which actuate our passions, and sentiments, are put in opposition to the more powerful principles of our nature, they vanish like smoke (*E* 12.21)

More substantial is a *philosophical* variant of scepticism about induction, Hume's own argument from Section IV in summary form (*E* 12.22). This too can be criticized as excessive if it goes to the Pyrrhonian extreme of attempting to undermine all belief, but fortunately for our survival, human nature is too strong to make such avoidance of belief

a genuine possibility. We simply cannot help forming beliefs through custom, as Hume has already explained in Section V, even though we have no rational basis for the assumption of uniformity on which such beliefs are founded.

This appeal to the unavoidability of belief can be used to dismiss total scepticism—i.e. 'undistinguished doubts' (*E* 12.24) about everything—but it need not imply an indiscriminate *acceptance* of whatever we are inclined to believe. Indeed Hume suggests that a sceptical appreciation of the weakness of our faculties, combined with a recognition of the practical inevitability of belief, can lead us to a form of undogmatic *mitigated* scepticism in which our doubts and beliefs are cautiously assessed and 'corrected by common sense and reflection'. It is also natural to combine this caution with a modest restriction of our enquiries to 'such subjects as are best adapted to the narrow capacity of human understanding' (*E* 12.25), given that even in common life, we cannot provide any solid reason for supposing our faculties to be reliable. Empirical science can comfortably be accommodated by this approach, in so far as it is simply a more systematic application of everyday inductive reasoning, that is, 'the reflections of common life, methodized and corrected'. Moreover the earlier sections of the *Enquiry* have already shown what such methodizing and correction involves, and how custom can ground such procedures as the explanation of phenomena by relatively simple and potentially quantifiable laws (*E* 4.12–13, 7.25 endnote [D], 7.29 endnote [E]), the calculation of probabilities by past frequencies (*E* 6.2–4, 10.3–7), the systematic search for hidden causes (*E* 8.13–15), the use of analogy (*E* 9.1, 11.24–6), proportionate inference (*E* 11.12–16), and so on.

The overall shape of this defence of inductive science is most concisely sketched by Philo in Hume's posthumous *Dialogues concerning Natural Religion*. Scepticism may be theoretically irrefutable, but even the sceptic must 'act . . . and live, and converse, like other men', since human nature gives him no choice. Reasonings of common life are thus vindicated, but we may well be driven further by curiosity, in which case our scientific speculations can also share in this vindication if they proceed in the same spirit, as a systematic extension of everyday inductive thinking:

> [The sceptic] considers . . . that every one, even in common life, is constrained to have more or less of this philosophy; that from our earliest infancy we make continual advances in forming more general principles of conduct and

reasoning; that the larger experience we acquire, and the stronger reason we are endued with, we always render our principles the more general and comprehensive; and that what we call *philosophy* [i.e. natural philosophy or science] is nothing but a more regular and methodical operation of the same kind. To philosophise on such subjects is nothing essentially different from reasoning on common life; and we may only expect greater stability, if not greater truth, from our philosophy, on account of its exacter and more scrupulous method of proceeding. (*D* 134, pp. 154–5 below)

Hume's scepticism thus leaves room for a scientific approach founded on modest inductive systematization, but the sceptical thrust remains in what is *excluded*. All knowledge of matter of fact beyond what we immediately perceive and remember depends on causation (*E* 4.4), while causal laws—whether concerning the operations of matter (*E* 4.6–13, 7.6–8) or mind (*E* 7.9–20)—are discoverable only by experience. 'If we reason *à priori*, any thing may appear able to produce any thing' (*E* 12.29). Hence rational insight into the nature of things is a hopeless fantasy, and it is impossible a priori to prove the existence of God, or indeed of anything else (*E* 12.13, 12.28–9).

Thus a priori demonstration is limited to the abstract realm of ideas, but only in mathematics are our ideas sufficiently precise to make demonstrative argument genuinely fruitful (*E* 12.27). The upshot of all this is to limit the worthwhile fields of investigation to mathematics (which is a priori but concerns only relations of ideas) and inductive empirical science (which concerns matters of fact but is uncertain and empirical). Any work that purports to transcend these limits, by establishing matters of fact with demonstrative certainty—what Immanuel Kant would later call 'synthetic a priori knowledge'—can therefore be roundly condemned, as Hume expresses in his famous concluding paragraph:

When we run over libraries, persuaded of these principles, what havoc must we make? If we take in our hand any volume; of divinity or school metaphysics, for instance; let us ask, *Does it contain any abstract reasoning containing quantity or number?* No. *Does it contain any experimental reasoning concerning matter of fact and existence?* No. Commit it then to the flames: for it can contain nothing but sophistry and illusion. (*E* 12.34)