THE EVOLUTION OF EVERYTHING

HOW NEW IDEAS EMERGE

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PROLOGUE

The General Theory of Evolution

The word ‘evolution’ originally means ‘unfolding’. Evolution is a story, a narrative of how thing change. It is a word freighted with many other meanings, of particular kinds of change. It implies th emergence of something from something else. It has come to carry a connotation of incremental an gradual change, the opposite of sudden revolution. It is both spontaneous and inexorable. It suggest cumulative change from simple beginnings. It brings the implication of change that comes fro within, rather than being directed from without. It also usually implies change that has no goal, but open-minded about where it ends up. And it has of course acquired the very specific meaning genetic descent with modification over the generations in biological creatures through the mechanis of natural selection.

This book argues that evolution is happening all around us. It is the best way of understanding ho the human world changes, as well as the natural world. Change in human institutions, artefacts an habits is incremental, inexorable and inevitable. It follows a narrative, going from one stage to th next; it creeps rather than jumps; it has its own spontaneous momentum, rather than being driven fro outside; it has no goal or end in mind; and it largely happens by trial and error – a version of natur selection. Take, for example, electric light. When an obscure engineer named Thomas Newcomen 1712 hit upon the first practical method of turning heat into work, he could have had no notion that th basic principle behind his invention – the expansion of water when boiled to make steam – wou eventually result, via innumerable small steps, in machines that generate electricity to provi artificial light: heat to work to light. The change from incandescent to fluorescent and next to LE light is still unfolding. The sequence of events was and is evolutionary.

My argument will be that in all these senses, evolution is far more common, and far mo influential, than most people recognise. It is not confined to genetic systems, but explains the way th virtually all of human culture changes: from morality to technology, from money to religion. The wa in which these streams of human culture flow is gradual, incremental, undirected, emergent and drive by natural selection among competing ideas. People are the victims, more often than the perpetrator of unintended change. And though it has no goal in mind, cultural evolution none the less produc functional and ingenious solutions to problems – what biologists call adaptation. In the case of th forms and behaviours of animals and plants, we find this apparent purposefulness hard to expla without imputing deliberate design. How can it not be that the eye was designed for seeing? In th same way, we assume that when we find human culture being well adapted to solve human problem we tend to assume that this is because some clever person designed it with that end in mind. So w tend to give too much credit to whichever clever person is standing nearby at the right moment.

The way that human history is taught can therefore mislead, because it places far too muc emphasis on design, direction and planning, and far too little on evolution. Thus, it seems th generals win battles; politicians run countries; scientists discover truths; artists create genre

inventors make breakthroughs; teachers shape minds; philosophers change minds; priests tea morality; businessmen lead businesses; conspirators cause crises; gods make morality. Not ju individuals, but institutions too: Goldman Sachs, the Communist Party, the Catholic Church, Al Qae – these are said to shape the world.

That's the way I was taught. I now think it is more often wrong than right. Individuals can make difference, of course, and so can political parties or big companies. Leadership still matters. But there is one dominant myth about the world, one huge mistake we all make, one blind spot, it is th we all go around assuming the world is much more of a planned place than it is. As a result, again an again we mistake cause for effect; we blame the sailing boat for the wind, or credit the bystander wi causing the event. A battle is won, so a general must have won it (not the malaria epidemic th debilitated the enemy army); a child learns, so a teacher must have taught her (not the books, pee and curiosity that the teacher helped her find); a species is saved, so a conservationist must have save it (not the invention of fertiliser which cut the amount of land needed to feed the population); a invention is made, so an inventor must have invented it (not the inexorable, inevitable ripeness of th next technological step); a crisis occurs, so we see a conspiracy (and not a cock-up). We describe th world as if people and institutions were always in charge, when often they are not. As Nassim Tale remarks in his book *Antifragile*, in a complex world the very notion of 'cause' is suspect: 'anoth reason to ignore newspapers with their constant supply of causes for things'.

Taleb is brutally dismissive of what he mockingly calls the Soviet-Harvard illusion, which h defines as lecturing birds on flight and thinking that the lecture caused their skill at flying. Ada Smith was no less rude about what he called the man of system, who imagines 'that he can arrange th different members of a great society with as much ease as the hand arranges the different pieces upo a chess-board', without considering that on the great chessboard of human society, the pieces have motion of their own.

To use a word coined by Abraham Lincoln, I hope gradually to 'disenthrall' you over the course o this book, from the obsession with human intentionality, design and planning. I want to do for ever aspect of the human world a little bit of what Charles Darwin did for biology, and get you to see pa the illusion of design, to see the emergent, unplanned, inexorable and beautiful process of change th lies underneath.

I have often noticed that human beings are surprisingly bad at explaining their own world. If a anthropologist from Alpha Centauri were to arrive here and ask some penetrating questions, he woul get no good answers. Why is the homicide rate falling all around the world? Criminologists cann agree. Why is global average income more than ten times what it was in the nineteenth century Economic historians are divided. Why did some Africans start to invent cumulative technology an civilisation around 200,000 years ago? Anthropologists do not know. How does the world econom work? Economists pretend to explain, but they cannot really do so in any detail.

These phenomena belong in a strange category, first defined in 1767 by a Scottish army chapla by the name of Adam Ferguson: they are the result of human action, but not of human design. The are *evolutionary* phenomena, in the original meaning of the word – they unfold. And evolutiona phenomena such as these are everywhere and in everything. Yet we fail to recognise this category. Ou language and our thought divide the world into two kinds of things – those designed and made b people, and natural phenomena with no order or function. The economist Russ Roberts once pointe out that we have no word to encompass such phenomena. The umbrella that keeps you dry in a show of rain is the result of both human action and human design, whereas the rainstorm that soaks yo when you forget it is neither. But what about the system that enables a local shop to sell you a

umbrella, or the word umbrella itself, or the etiquette that demands that you tilt your umbrella to on side to let another pedestrian pass? These – markets, language, customs – are man-made things. B none of them is designed by a human being. They all emerged unplanned.

We transfer this thinking back into our understanding of the natural world too. We see purposefu design in nature, rather than emergent evolution. We look for hierarchy in the genome, for a 'self' i the brain, and for free will in the mind. We latch on to any excuse to blame an extreme weather even on human agency – whether witchdoctoring or man-made global warming.

Far more than we like to admit, the world is to a remarkable extent a self-organising, sel changing place. Patterns emerge, trends evolve. Skeins of geese form Vs in the sky without meanin to, termites build cathedrals without architects, bees make hexagonal honeycombs without instructio brains take shape without brain-makers, learning can happen without teaching, political events a shaped by history rather than vice versa. The genome has no master gene, the brain has no comman centre, the English language has no director, the economy has no chief executive, society has n president, the common law has no chief justice, the climate has no control knob, history has no fiv star general.

In society, people are the victims and even the immediate agents of change, but more often tha not the causes are elsewhere – they are emergent, collective, inexorable forces. The most powerful these inexorable forces is biological evolution by natural selection itself, but there are other, simpl forms of evolutionary, unplanned change. Indeed, to borrow a phrase from a theorist of innovatio Richard Webb, Darwinism is the 'special theory of evolution'; there's a general theory of evolutio too, and it applies to much more than biology. It applies to society, money, technology, language, law culture, music, violence, history, education, politics, God, morality. The general theory says th things do not stay the same; they change gradually but inexorably; they show 'path dependence'; the show descent with modification; they show trial and error; they show selective persistence. An human beings none the less take credit for this process of endogenous change as if it was directe from above.

This truth continues to elude most intellectuals on the left as well as the right, who remain effect 'creationists'. The obsession with which those on the right resist Charles Darwin's insight – th the complexity of nature does not imply a designer – matches the obsession with which those on th left resist Adam Smith's insight – that the complexity of society does not imply a planner. In th pages that follow, I shall take on this creationism in all its forms.

1

The Evolution of the Universe

If you possess a firm grasp of these tenets, you will see
That Nature, rid of harsh taskmasters, all at once is free
And everything she does, does on her own, so that gods play
No part . . .

Lucretius, *De Rerum Natura*, Book 2, lines 1090–3

A ‘skyhook’ is an imaginary device for hanging an object from the sky. The word originated in sarcastic remark by a frustrated pilot of a reconnaissance plane in the First World War, when told t stay in the same place for an hour: ‘This machine is not fitted with skyhooks,’ he replied. Th philosopher Daniel Dennett used the skyhook as a metaphor for the argument that life shows eviden of an intelligent designer. He contrasted skyhooks with cranes – the first impose a solutio explanation or plan on the world from on high; the second allow solutions, explanations or patterns emerge from the ground up, as natural selection does.

The history of Western thought is dominated by skyhooks, by devices for explaining the world a the outcome of design and planning. Plato said that society worked by imitating a designed cosm order, a belief in which should be coercively enforced. Aristotle said that you should look for inhere principles of intentionality and development – souls – within matter. Homer said gods decided th outcome of battles. St Paul said that you should behave morally because Jesus told you so. Mohame said you should obey God’s word as transmitted through the Koran. Luther said that your fate was God’s hands. Hobbes said that social order came from a monarch, or what he called ‘Leviathan’ – th state. Kant said morality transcended human experience. Nietzsche said that strong leaders made f good societies. Marx said that the state was the means of delivering economic and social progres Again and again, we have told ourselves that there is a top–down description of the world, and a top down prescription by which we should live.

But there is another stream of thought that has tried and usually failed to break through. Perhap its earliest exponent was Epicurus, a Greek philosopher about whom we know very little. From wh later writers said about his writings, we know that he was born in 341 BC and thought (as far as we ca tell) that the physical world, the living world, human society and the morality by which we live a emerged as spontaneous phenomena, requiring no divine intervention nor a benign monarch or nann state to explain them. As interpreted by his followers, Epicurus believed, following another Gree philosopher, Democritus, that the world consisted not of lots of special substances including spiri and humours, but simply of two kinds of thing: voids and atoms. Everything, said Epicurus, is made invisibly small and indestructible atoms, separated by voids; the atoms obey the laws of nature ar

every phenomenon is the result of natural causes. This was a startlingly prescient conclusion for th
fourth century BC.

Unfortunately Epicurus's writings did not survive. But three hundred years later, his ideas wer
revived and explored in a lengthy, eloquent and unfinished poem, *De Rerum Natura* (*Of the Nature o
Things*), by the Roman poet Titus Lucretius Carus, who probably died in mid-stanza around 49 BC
just as dictatorship was looming in Rome. Around this time, in Gustave Flaubert's words, 'when th
gods had ceased to be, and Christ had not yet come, there was a unique moment in history, betwee
Cicero and Marcus Aurelius when man stood alone'. Exaggerated maybe, but free thinking was
least more possible then than before or after. Lucretius was more subversive, open-minded and fa
seeing than either of those politicians (Cicero admired, but disagreed with, him). His poem rejects a
magic, mysticism, superstition, religion and myth. It sticks to an unalloyed empiricism.

As the Harvard historian Stephen Greenblatt has documented, a bald list of the propositio
Lucretius advances in the unfinished 7,400 hexameters of *De Rerum Natura* could serve as an agend
for modernity. He anticipated modern physics by arguing that everything is made of differe
combinations of a limited set of invisible particles, moving in a void. He grasped the current idea th
the universe has no creator, Providence is a fantasy and there is no end or purpose to existence, onl
ceaseless creation and destruction, governed entirely by chance. He foreshadowed Darwin
suggesting that nature ceaselessly experiments, and those creatures that can adapt and reproduce wi
thrive. He was with modern philosophers and historians in suggesting that the universe was n
created for or about human beings, that we are not special, and there was no Golden Age o
tranquillity and plenty in the distant past, but only a primitive battle for survival. He was like mode
atheists in arguing that the soul dies, there is no afterlife, all organised religions are superstitiou
delusions and invariably cruel, and angels, demons or ghosts do not exist. In his ethics he thought th
highest goal of human life is the enhancement of pleasure and the reduction of pain.

Thanks largely to Greenblatt's marvellous book *The Swerve*, I have only recently come to kno
Lucretius, and to appreciate the extent to which I am, and always have been without knowing it,
Lucretian/Epicurean. Reading his poem in A.E. Stallings's beautiful translation in my sixth decade
to be left fuming at my educators. How could they have made me waste all those years at scho
plodding through the tedious platitudes and pedestrian prose of Jesus Christ or Julius Caesar, whe
they could have been telling me about Lucretius instead, or as well? Even Virgil was writing partly
reaction to Lucretius, keen to re-establish respect for gods, rulers and top–down ideas in genera
Lucretius's notion of the ceaseless mutation of forms composed of indestructible substances – whic
the Spanish-born philosopher George Santayana called the greatest thought that mankind has ever h
upon – has been one of the persistent themes of my own writing. It is the central idea behind not ju
physics and chemistry, but evolution, ecology and economics too. Had the Christians not suppresse
Lucretius, we would surely have discovered Darwinism centuries before we did.

The Lucretian heresy

It is by the thinnest of threads that we even know the poem *De Rerum Natura*. Although it wa
mentioned and celebrated by contemporaries, and charred fragments of it have been found in the Vil
of the Papyri at Herculaneum (a library belonging probably to Julius Caesar's father-in-law), it sa
into obscurity for much of history. Passing quotations from it in the ninth century AD show that it wa

very occasionally being read by monks, but by 1417 no copy had been in wide circulation amon scholars for more than a millennium. As a text it was effectively extinct. Why?

It is not hard to answer that question. Lucretius's special contempt for all forms of superstitio and indeed his atomism, which contradicted the doctrine of transubstantiation, condemned him obscurity once the Christians took charge. His elevation of the pleasure principle – that the pursuit pleasure could lead to goodness and that there was nothing nice about pain – was incompatible wi the recurring Christian obsession that pleasure is sinful and suffering virtuous.*

Whereas Plato and Aristotle could be accommodated within Christianity, because of their belief the immortality of the soul and the evidence for design, the Epicurean heresy was so threatening to th Christian Church that Lucretius had to be suppressed. His atheism is explicit, even Dawkinsian, in i directness. The historian of philosophy Anthony Gottlieb compares a passage from Lucretius with on from Richard Dawkins's *The Selfish Gene*. The first talks of 'the generation of living creatures' b 'every sort of combination and motion'; the second of how 'unordered atoms could group themselv into ever more complex patterns until they ended up manufacturing people'. Lucretius was, carpe John Dryden, at times 'so much an atheist, he forgot to be a poet'. He talks about people 'crushe beneath the weight of superstition', claims that 'it is religion breeds wickedness' and aims to give u 'the power to fight against the superstitions and the threats of priests'. Little wonder they tried stamp him out.

They almost succeeded. St Jerome – keen to illustrate the wages of sin – dismissed Lucretius as lunatic, driven mad by a love potion, who then committed suicide. No evidence to support the calumnies exists; saints do not show their sources. The charge that all Epicureans were scandalou hedonists was trumped up and spread abroad, and it persists to this day. Copies of the poem wer rooted out of libraries and destroyed, as were any other Epicurean and sceptical works. Almost a traces of such materialist and humanist thought had apparently long since vanished from Europe whe in 1417 a Florentine scholar and recently unemployed papal secretary named Gian Francesco Pogg Bracciolini, stumbled upon a copy of the whole poem. Poggio was hunting for rare manuscripts libraries in central Germany when he came across a copy of *De Rerum Natura* in a monastic libra (probably at Fulda). He sent a hastily-made copy to his wealthy bibliophile friend Niccolò Nicco whose transcription was then copied more than fifty times. In 1473 the book was printed and th Lucretian heresy began to infect minds all across Europe.

Newton's nudge

In his passionate attachment to rationalism, materialism, naturalism, humanism and liberty, Lucretiu deserves a special place in the history of Western thought, even above the beauty of his poetry. Th Renaissance, the scientific revolution, the Enlightenment and the American Revolution were a inspired by people who had to some degree imbibed Lucretius. Botticelli's *Venus* effectively depic the opening scene of Lucretius's poem. Giordano Bruno went to the stake, with his mouth pinned sh to silence his heresies, for quoting Lucretius on the recombination of atoms and the awe with whic we should embrace the idea that human beings are not the purpose of the universe. Galileo's Lucretia atomism, as well as his Copernican heliocentrism, was used against him at his trial. Indeed, th historian of science Catherine Wilson has argued that the whole of seventeenth-century empiricism started by Pierre Gassendi in opposition to Descartes, and taken up by the most influential thinkers

the age, including Thomas Hobbes, Robert Boyle, John Locke, Gottfried Leibniz and Bishop Berkele was fuelled to a remarkable extent by the sudden popularity of Lucretius.

As Lucretian ideas percolated, the physicists were the first to see where they led. Isaac Newto became acquainted with Epicurean atomism as a student at Cambridge, when he read a book by Walt Charleton expounding Gassendi's interpretation of Lucretius. Later he acquired a Latin edition of *L Rerum Natura* itself, which survives from his library and shows signs of heavy use. He echoe Lucretian ideas about voids between atoms throughout his books, especially the *Opticks*.

Newton was by no means the first modern thinker to banish a skyhook, but he was one of the bes He explained the orbits of the planets and the falling of apples by gravity, not God. In doing so, he d away with the need for perpetual divine interference and supervision by an overworked creato Gravity kept the earth orbiting the sun without having to be told. Jehovah might have kicked the ba but it rolled down the hill of its own accord.

Yet Newton's disenthralment was distinctly limited. He was furious with anybody who read int this that God might not be in ultimate charge, let alone not exist. He asserted firmly that: 'This mo elegant system of the sun, planets, and comets could not have arisen without the design and dominio of an intelligent and powerful being.' His reasoning was that, according to his calculations, the sol system would eventually spin off into chaos. Since it apparently did not, God must be intervenin periodically to nudge the planets back into their orbits. Jehovah has a job after all, just a part-tim one.

The swerve

That's that then. A skyhook still exists, just out of sight. Again and again this was the pattern of th Enlightenment: gain a yard of ground from God, but then insist he still holds the field beyond an always will. It did not matter how many skyhooks were found to be illusory, the next one was alway going to prove real. Indeed, so common is the habit of suddenly seeing design, after all the hard wo has been done to show that emergence is more plausible, that I shall borrow a name for it – th swerve. Lucretius himself was the first to swerve. In a world composed of atoms whose motions we predictable, Lucretius (channelling Democritus and Epicurus) could not explain the apparent huma capacity for free will. In order to do so, he suggested, arbitrarily, that atoms must occasionally swerv unpredictably, because the gods make them do so. This failure of nerve on the part of the poet ha been known since as the Lucretian swerve, but I intend to use the same phrase more generally for eac occasion on which I catch a philosopher swerving to explain something he struggles to understan and positing an arbitrary skyhook. Watch out, in the pages that follow, for many Lucretian swerves.

Newton's rival, Gottfried Leibniz, in his 1710 treatise on theodicy, attempted a sort o mathematical proof that God existed. Evil stalked the world, he concluded, the better to bring out th best in people. God was always calculating carefully how to minimise evil, if necessary by allowin disasters to occur that killed more bad people than good. Voltaire mocked Leibniz's 'optimism', word that then meant almost the opposite of what it means today: that the world was perfect an unimprovable ('optimal'), because God had made it. After 60,000 people died in the Lisbo earthquake of 1755, on the morning of All Saints' Day when the churches were full, theologian followed Leibniz in explaining helpfully that Lisbon had earned its punishment by sinning. This wa too much for Voltaire, who asked sardonically in a poem: 'Was then more vice in fallen Lisbo

found/Than Paris, where voluptuous joys abound?'

Newton's French follower Pierre-Louis Maupertuis went to Swedish Lapland to prove that th earth was flattened towards the poles, as Newtonian mechanics predicted. He then moved on fro Newton by rejecting other arguments for the existence of God founded on the wonders of nature, the regularity of the solar system. But having gone thus far, he suddenly stopped (his Lucretia swerve), concluding that his own 'least action' principle to explain motion displayed such wisdom o the part of nature that it must be the product of a wise creator. Or, to paraphrase Maupertuis, if God as clever as me, he must exist. A blazing non sequitur.

Voltaire, perhaps irritated by the fact that his mathematically gifted mistress Emilie, Marquise d Châtelet had slept with Maupertuis and had written in defence of Leibniz, then based his character I Pangloss in his novel *Candide* on an amalgam of Leibniz and Maupertuis. Pangloss remains blissful persuaded – and convinces the naïve Candide – that this is the best of all possible worlds, even as the both experience syphilis, shipwreck, earthquake, fire, slavery and being hanged. Voltaire's contemp for theodicy derived directly and explicitly from Lucretius, whose arguments he borrowed throughou life, styling himself at one point the 'latter-day Lucretius'.

Pasta or worms?

Voltaire was by no means the first poet or prose stylist to draw upon Lucretius, nor would he be th last. Thomas More tried to reconcile Lucretian pleasure with faith in *Utopia*. Montaigne quote Lucretius frequently, and echoed him in saying 'the world is but a perennial movement . . . all thing in it are in constant motion'; he recommended that we 'fall back into Epicurus' infinity of atoms Britain's Elizabethan and Jacobean poets, including Edmund Spenser, William Shakespeare, Joh Donne and Francis Bacon, all play with themes of explicit materialism and atomism that came eith directly or indirectly from Lucretius. Ben Jonson heavily annotated his Dutch edition of Lucretiu Machiavelli copied out *De Rerum Natura* in his youth. Molière, Dryden and John Evelyn translated i John Milton and Alexander Pope emulated, echoed and attempted to rebut it.

Thomas Jefferson, who collected five Latin versions of *De Rerum Natura* along with translation into three languages, declared himself an Epicurean, and perhaps deliberately echoed Lucretius in h phrase 'the pursuit of happiness'. The poet and physician Erasmus Darwin, who helped inspire not ju his evolutionary grandson but many of the Romantic poets too, wrote his epic, erotic, evolutionar philosophical poems in conscious imitation of Lucretius. His last poem, *The Temple of Nature*, w intended as his version of *De Rerum Natura*.

The influence of this great Roman materialist culminates rather neatly in the moment when Ma Shelley had the idea for *Frankenstein*. She had her epiphany after listening to her husband Perc discuss with George, Lord Byron, the coming alive of 'vermicelli' that had been left to ferment, i experiments of 'Dr Darwin'. Given that Shelley, Byron and Erasmus Darwin were all enthusiast Lucretians, perhaps she misheard and, rather than debating the resurrection of pasta, they we actually quoting the passage in *De Rerum Natura* (and Darwin's experimental imitation of it) whe Lucretius discusses spontaneous generation of little worms in rotting vegetable matter – 'vermiculos Here is the history of Western thought in a single incident: a Classical writer, rediscovered in th Renaissance, who inspired the Enlightenment and influenced the Romantic movement, then sparks th most famous Gothic novel, whose villain becomes a recurring star of modern cinema.

Lucretius haunted philosophers of the Enlightenment, daring free thinkers further down the pa
that leads away from creationist thinking. Pierre Bayle, in his *Thoughts on the Comet of 1680*, close
followed Lucretius's Book 5 in suggesting that the power of religion derived from fear. Montesquie
channelled Lucretius in the very first sentence of *The Spirit of the Laws* (1748): 'Laws in their mo
general signification, are the necessary relations arising from the *nature of things*' (my emphasis
Denis Diderot in his *Philosophical Thoughts* echoed Lucretius to the effect that nature was devoid
purpose, the motto for his book being a line from *De Rerum Natura*: 'Now we see out of the dark wh
is in the light'. Later, in *The Letter on the Blind and the Deaf*, Diderot suggested that God himself w
a mere product of the senses, and went to jail for the heresy. The atheist philosopher Paul-Henri, barc
d'Holbach, took Lucretian ideas to their ultimate extreme in his *Le Système de la Nature* of 177
D'Holbach saw nothing but cause and effect, and matter in motion: 'no necessity to have recourse
supernatural powers to account for the formation of things'.

One place where such scepticism began to take hold was in geology. James Hutton, a farmer fro
southern Scotland, in 1785 laid out a theory that the rocks beneath our feet were made by processes
erosion and uplift that are still at work today, and that no great Noachian flood was needed to expla
seashells on mountaintops: 'Hence we are led to conclude, that the greater part of our land, if not t
whole, had been produced by operations natural to this globe.' He glimpsed the vast depths
geological time, saying famously, 'We find no vestige of a beginning – no prospect of an end.' Fo
this he was vilified as a blasphemer and an atheist. The leading Irish scientist Richard Kirwan evo
went as far as to hint that ideas like Hutton's contributed to dangerous events like the Frenc
Revolution, remarking on how they had 'proved too favourable to the structure of various systems
atheism or infidelity, as these have been in their turn to turbulence and immorality'.

No need of that hypothesis

The physicists, who had set the pace in tearing down skyhooks, continued to surprise the world. It fe
to Pierre-Simon Laplace (using Emilie du Châtelet's improvements to cumbersome Newtonia
geometry) to take Newtonism to its logical conclusion. Laplace argued that the present state of t
universe was 'the effect of its past and the cause of its future'. If an intellect were powerful enough
calculate every effect of every cause, then 'nothing would be uncertain and the future just like the pa
would be present before its eyes'. By mathematically showing that there was no need in t
astronomical world even for Newton's Nudge God to intervene to keep the solar system stabl
Laplace took away that skyhook. 'I had no need of that hypothesis,' he told Napoleon.

The certainty of Laplace's determinism eventually crumbled in the twentieth century under assau
from two directions – quantum mechanics and chaos theory. At the subatomic level, the world turne
out to be very far from Newtonian, with uncertainty built into the very fabric of matter. Even at t
astronomical scale, Henri Poincaré discovered that some arrangements of heavenly bodies resulted
perpetual instability. And as the meteorologist Edward Lorenz realised, exquisite sensitivity to initi
conditions meant that weather systems were inherently unpredictable, asking, famously, in the title
a lecture in 1972: 'Does the flap of a butterfly's wings in Brazil set off a tornado in Texas?'

But here's the thing. These assaults on determinism came from below, not above; from within, n
without. If anything they made the world a still more Lucretian place. The impossibility of forecastin
the position of an electron, or the weather a year ahead, made the world proof against the confiden

of prognosticators and experts and planners.

The puddle that fits its pothole

Briefly in the late twentieth century, some astronomers bought into a new skyhook called th ‘anthropic principle’. In various forms, this argued that the conditions of the universe, and th particular values of certain parameters, seemed ideally suited to the emergence of life. In other word if things had been just a little bit different, then stable suns, watery worlds and polymerised carbo would not be possible, so life could never get started. This stroke of cosmic luck implied that we live in some kind of privileged universe uncannily suitable for us, and this was somehow spooky and cool

Certainly, there do seem to be some remarkably fortuitous features of our own universe witho which life would be impossible. If the cosmological constant were any larger, the pressure antigravity would be greater and the universe would have blown itself to smithereens long befo galaxies, stars and planets could have evolved. Electrical and nuclear forces are just the right streng for carbon to be one of the most common elements, and carbon is vital to life because of its capaci to form multiple bonds. Molecular bonds are just the right strength to be stable but breakable at th sort of temperatures found at the typical distance of a planet from a star: any weaker and the univer would be too hot for chemistry, any stronger and it would be too cold.

True, but to anybody outside a small clique of cosmologists who had spent too long with the telescopes, the idea of the anthropic principle was either banal or barmy, depending on how seriously you take it. It so obviously confuses cause and effect. Life adapted to the laws of physics, not vic versa. In a world where water is liquid, carbon can polymerise and solar systems last for billions years, then life emerged as a carbon-based system with water-soluble proteins in fluid-filled cells. In different world, a different kind of life might emerge, if it could. As David Waltham puts it in h book *Lucky Planet*, ‘It is all but inevitable that we occupy a favoured location, one of the ra neighbourhoods where by-laws allow the emergence of intelligent life.’ No anthropic princip needed.

Waltham himself goes on to make the argument that the earth may be rare or even unique becaus of the string of ridiculous coincidences required to produce a planet with a stable temperature wi liquid water on it for four billion years. The moon was a particular stroke of luck, having been forme by an interplanetary collision and having then withdrawn slowly into space as a result of the earth tides (it is now ten times as far away as when it first formed). Had the moon been a tiny bit bigger smaller, and the earth’s day a tiny bit longer or shorter after the collision, then we would have had a unstable axis and a tendency to periodic life-destroying climate catastrophes that would hav precluded the emergence of intelligent life. God might claim credit for this lunar coincidence, b Gaia – James Lovelock’s theory that life itself controls the climate – cannot. So we may b extraordinarily lucky and vanishingly rare. But that does not make us special: we would not be here it had not worked out so far.

Leave the last word on the anthropic principle to Douglas Adams: ‘Imagine a puddle waking u one morning and thinking, “This is an interesting world I find myself in – an interesting hole I fi myself in – fits me rather neatly, doesn’t it? In fact it fits me staggeringly well, may have been mad to have me in it!”’

Thinking for ourselves

It is no accident that political and economic enlightenment came in the wake of Newton and h followers. As David Bodanis argues in his biography of Voltaire and his mistress, *Passionate Mind* people would be inspired by Newton's example to question traditions around them that had apparentl been accepted since time immemorial. 'Authority no longer had to come from what you were told by priest or a royal official, and the whole establishment of the established church or the state behin them. It could come, dangerously, from small, portable books – and even from ideas you came t yourself.'

Gradually, by reading Lucretius and by experiment and thought, the Enlightenment embraced th idea that you could explain astronomy, biology and society without recourse to intelligent desig Nikolaus Copernicus, Galileo Galilei, Baruch Spinoza and Isaac Newton made their tentative step away from top–down thinking and into the bottom–up world. Then, with gathering excitement, Locke and Montesquieu, Voltaire and Diderot, Hume and Smith, Franklin and Jefferson, Darwin an Wallace, would commit similar heresies against design. Natural explanations displaced supernatura ones. The emergent world emerged.

2

The Evolution of Morality

O miserable minds of men! O hearts that cannot see!
Beset by such great dangers and in such obscurity
You spend your lot of life! Don't you know it's plain
That all your nature yelps for is a body free from pain,
And, to enjoy pleasure, a mind removed from fear and care?

Lucretius, *De Rerum Natura*, Book 2, lines 1–5

Soon a far more subversive thought evolved from the followers of Lucretius and Newton. What morality itself was not handed down from the Judeo-Christian God as a prescription? And was n even the imitation of a Platonic ideal, but was a spontaneous thing produced by social interactio among people seeking to find ways to get along? In 1689, John Locke argued for religious tolerance though not for atheists or Catholics – and brought a storm of protest down upon his head from tho who saw government enforcement of religious orthodoxy as the only thing that prevented society fro descending into chaos. But the idea of spontaneous morality did not die out, and some time lat David Hume and then Adam Smith began to dust it off and show it to the world: morality as spontaneous phenomenon. Hume realised that it was good for society if people were nice to eac other, so he thought that rational calculation, rather than moral instruction, lay behind social cohesio Smith went one step further, and suggested that morality emerged unbidden and unplanned from peculiar feature of human nature: sympathy.

Quite how a shy, awkward, unmarried professor from Kirkcaldy who lived with his mother an ended his life as a customs inspector came to have such piercing insights into human nature is one history's great mysteries. But Adam Smith was lucky in his friends. Being taught by the brilliant Iris lecturer Francis Hutcheson, talking regularly with David Hume, and reading Denis Diderot's ne *Encyclopédie*, with its relentless interest in bottom–up explanations, gave him plenty with which get started. At Balliol College, Oxford, he found the lecturers 'had altogether given up even th pretence of teaching', but the library was 'marvellous'. Teaching in Glasgow gave him experience merchants in a thriving trading port and 'a feudal, Calvinist world dissolving into a commercia capitalist one'. Glasgow had seen explosive growth thanks to increasing trade with the New World the eighteenth century, and was fizzing with entrepreneurial energy. Later, floating around France a the tutor to the young Duke of Buccleuch enabled Smith to meet d'Holbach and Voltaire, who thoug him 'an excellent man. We have nothing to compare with him.' But that was after his first, penetratin book on human nature and the evolution of morality. Anyway, somehow this shy Scottish ma stumbled upon the insights to explore two gigantic ideas that were far ahead of their time. Bo

concerned emergent, evolutionary phenomena: things that are the result of human action, but not th result of human design.

Adam Smith spent his life exploring and explaining such emergent phenomena, beginning wi language and morality, moving on to markets and the economy, ending with the law, though he neve published his planned book on jurisprudence. Smith began lecturing on moral philosophy at Glasgo University in the 1750s, and in 1759 he put together his lectures as a book, *The Theory of Mor Sentiments*. Today it seems nothing remarkable: a dense and verbose eighteenth-century ramb through ideas about ethics. It is not a rattling read. But in its time it was surely one of the mo subversive books ever written. Remember that morality was something that you had to be taught, an that without Jesus telling us what to teach, could not even exist. To try to raise a child without mor teaching and expect him to behave well was like raising him without Latin and expecting him to reci Virgil. Adam Smith begged to differ. He thought that morality owed little to teaching and nothing t reason, but evolved by a sort of reciprocal exchange within each person's mind as he or she grew fro childhood, and within society. Morality therefore emerged as a consequence of certain aspects o human nature in response to social conditions.

As the Adam Smith scholar James Otteson has observed, Smith, who wrote a history of astronom early in his career, saw himself as following explicitly in Newton's footsteps, both by looking fo regularities in natural phenomena and by employing the parsimony principle of using as simple a explanation as possible. He praised Newton in his history of astronomy for the fact that he 'discovere that he could join together the movement of the planets by so familiar a principle of connection Smith was also part of a Scottish tradition that sought cause and effect in the history of a topi instead of asking what is the perfect Platonic ideal of a moral system, ask rather how it came about.

It was exactly this modus operandi that Smith brought to moral philosophy. He wanted t understand where morality came from, and to explain it simply. As so often with Adam Smith, h deftly avoided the pitfalls into which later generations would fall. He saw straight through the natur versus-nurture debate and came up with a nature-via-nurture explanation that was far ahead of i time. He starts *The Theory of Moral Sentiments* with a simple observation: we all enjoy making oth people happy.

> How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortunes of others, and render their happiness necessary to him, though he derives nothing from it, but the pleasure of seeing it.

And we all desire what he calls mutual sympathy of sentiments: 'Nothing pleases us more than observe in other men a fellow-feeling with all the emotions of our own breast.' Yet the childles Smith observed that a child does not have a sense of morality, and has to find out the hard way that h or she is not the centre of the universe. Gradually, by trial and error, a child discovers what behaviou leads to mutual sympathy of sentiments, and therefore can make him or her happy by making othe happy. It is through everybody accommodating their desires to those of others that a system of share morality arises, according to Smith. An invisible hand (the phrase first appears in Smith's lectures o astronomy, then here in *Moral Sentiments* and once more in *The Wealth of Nations*) guides us toward a common moral code. Otteson explains that the hand is invisible, because people are not setting o to create a shared system of morality; they aim only to achieve mutual sympathy now with the peop they are dealing with. The parallel with Smith's later explanation of the market is clear to see: bo

are phenomena that emerge from individual actions, but not from deliberate design.

Smith's most famous innovation in moral philosophy is the 'impartial spectator', who we imagi to be watching over us when we are required to be moral. In other words, just as we learn to be mor by judging others' reactions to our actions, so we can imagine those reactions by positing a neutr observer who embodies our conscience. What would a disinterested observer, who knows all the fact think of our conduct? We get pleasure from doing what he recommends, and guilt from not doing s Voltaire put it pithily: 'The safest course is to do nothing against one's conscience. With this secre we can enjoy life and have no fear from death.'

How morality emerges

There is, note, no need for God in this philosophy. As a teacher of Natural Theology among oth courses, Smith was no declared atheist, but occasionally he strays dangerously close to Lucretia scepticism. It is hardly surprising that he at least paid lip service to God, because three of h predecessors at Glasgow University, including Hutcheson, had been charged with heresy for n sticking to Calvinist orthodoxy. The mullahs of the day were vigilant. There remains one tantalisin anecdote from a student, a disapproving John Ramsay, that Smith 'petitioned the Senatus . . . to b relieved of the duty of opening his class with a prayer', and, when refused, that his lectures led h students to 'draw an unwarranted conclusion, viz. that the great truths of theology, together with th duties which man owes to God and his neighbours, may be discovered in the light of nature witho any special revelation'. The Adam Smith scholar Gavin Kennedy points out that in the sixth editio (1789) of *The Theory of Moral Sentiments*, published after his devout mother died, Smith excised changed many religious references. He may have been a closet atheist, but he might also have been theist, not taking Christianity literally, but assuming that some kind of god implanted benevolence the human breast.

Morality, in Smith's view, is a spontaneous phenomenon, in the sense that people decide their ow moral codes by seeking mutual sympathy of sentiments in society, and moralists then observe an record these conventions and teach them back to people as top–down instructions. Smith is essential saying that the priest who tells you how to behave is basing his moral code on observations of wh moral people actually do.

There is a good parallel with teachers of grammar, who do little more than codify the patterns the see in everyday speech and tell them back to us as rules. Only occasionally, as with split infinitive do their rules go counter to what good writers do. Of course, it is possible for a priest to invent an promote a new rule of morality, just as it is possible for a language maven to invent and promote new rule of grammar or syntax, but it is remarkably rare. In both cases, what happens is that usag changes and the teachers gradually go along with it, sometimes pretending to be the authors.

So, for example, in my lifetime, disapproval of homosexuality has become ever more moral unacceptable in the West, while disapproval of paedophilia has become ever more morally mandator Male celebrities who broke the rules with under-age girls long ago and thought little of it now fin themselves in court and in disgrace; while others who broke the (then) rules with adult men long ag and risked disgrace can now openly speak of their love. Don't get me wrong: I approve of both the trends – but that's not my point. My point is that the changes did not come about because some mor leader or committee ordained them, at least not mainly, let alone that some biblical instruction

make the changes came to light. Rather, the moral negotiation among ordinary people gradual changed the common views in society, with moral teachers reflecting the changes along the wa Morality, quite literally, evolved. In just the same way, words like ‘enormity’ and ‘prevaricate’ hav changed their meaning in my lifetime, though no committee met to consider an alteration in th meaning of the words, and there is very little the grammarians can do to prevent it. (Indee grammarians spend most of their time deploring linguistic innovation.) Otteson points out that Smi in his writing uses the word ‘brothers’ and ‘brethren’ interchangeably, with a slight preference for th latter. Today, however, the rules have changed, and you would only use ‘brethren’ for the plural o brothers if you were being affected, antiquarian or mocking.

Smith was acutely aware of this parallel with language, which is why he insisted on appending h short essay on the origin of language to his *Theory of Moral Sentiments* in its second and lat editions. In the essay, Smith makes the point that the laws of language are an invention, rather than discovery – unlike, say, the laws of physics. But they are still laws: children are corrected by the parents and their peers if they say ‘bringed’ instead of ‘brought’. So language is an ordered syster albeit arrived at spontaneously through some kind of trial and error among people trying to mak ‘their mutual wants intelligible to each other’. Nobody is in charge, but the system is orderly. What peculiar and novel idea. What a subversive thought. If God is not needed for morality, and if languag is a spontaneous system, then perhaps the king, the pope and the official are not quite as vital to th functioning of an orderly society as they pretend?

As the American political scientist Larry Arnhart puts it, Smith is a founder of a key tenet o liberalism, because he rejects the Western tradition that morality must conform to a transcendent cosmic order, whether in the form of a cosmic God, a cosmic Reason, or a cosmic Nature. ‘Instead o this transcendental moral cosmology, liberal morality is founded on an empirical moral anthropolog in which moral order arises from within human experience.’

Above all, Smith allows morality and language to change, to evolve. As Otteson puts it, for Smit moral judgements are generalisations arrived at inductively on the basis of past experience. We lo our own approvals and disapprovals of our own and others’ conduct, and observe others doing th same. ‘Frequently repeated patterns of judgement can come to have the appearance of moral duties even commandments from on high, while patterns that recur with less frequency will enjo commensurately less confidence.’ It is in the messy empirical world of human experience that we fin morality. Moral philosophers observe what we do; they do not invent it.

Better angels

Good grief. Here is an eighteenth-century, middle-class Scottish professor saying that morality is a accidental by-product of the way human beings adjust their behaviour towards each other as they gro up; saying that morality is an emergent phenomenon that arises spontaneously among human beings a relatively peaceful society; saying that goodness does not need to be taught, let alone associated wi the superstitious belief that it would not exist but for the divine origin of an ancient Palestinia carpenter. Smith sounds remarkably like Lucretius (whom he certainly read) in parts of his *Mor Sentiments* book, but he also sounds remarkably like Steven Pinker of Harvard University toda discussing the evolution of society towards tolerance and away from violence.

As I will explore, there is in fact a fascinating convergence here. Pinker’s account of morali

growing strongly over time is, at bottom, very like Smith's. To put it at its baldest, a Smithian chil developing his sense of morality in a violent medieval society in Prussia (say) by trial and erro would end up with a moral code quite different from such a child growing up in a peaceful Germa (say) suburb today. The medieval person would be judged moral if he killed people in defence of h honour or his city; whereas today he would be thought moral if he refused meat and gave copiously charity, and thought shockingly immoral if he killed somebody for any reason at all, and especially f honour. In Smith's evolutionary view of morality, it is easy to see how morality is relative and wi evolve to a different end point in different societies, which is exactly what Pinker documents.

Pinker's book *The Better Angels of Our Nature* chronicles the astonishing and continuing decli in violence of recent centuries. We have just lived through the decade with the lowest global dea rate in warfare on record; we have seen homicide rates fall by 99 per cent in most Western countri since medieval times; we have seen racial, sexual, domestic, corporal, capital and other forms violence in headlong retreat; we have seen discrimination and prejudice go from normal disgraceful; we have come to disapprove of all sorts of violence as entertainment, even again animals. This is not to say there is no violence left, but the declines that Pinker documents are qui remarkable, and our horror at the violence that still remains implies that the decline will continue. O grandchildren will stand amazed at some of the things we still find quite normal.

To explain these trends, Pinker turns to a theory first elaborated by Norbert Elias, who had th misfortune to publish it as a Jewish refugee from Germany in Britain in 1939, shortly before he w interned by the British on the grounds that he was German. Not a good position from which to sugge that violence and coercion were diminishing. It was not until it was translated into English thr decades later in 1969, in a happier time, that his theory was widely appreciated. Elias argued that 'civilising process' had sharply altered the habits of Europeans since the Middle Ages, that as peop became more urban, crowded, capitalist and secular, they became nicer too. He hit upon th paradoxical realisation – for which there is now, but was not then, strong statistical evidence – b combing the literature of medieval Europe and documenting the casual, frequent and routine violen that was then normal. Feuds flared into murders all the time; mutilation and death were commo punishments; religion enforced its rules with torture and sadism; entertainments were often violen Barbara Tuchman in her book *A Distant Mirror* gives an example of a popular game in mediev France: people with their hands tied behind their backs competed to kill a cat nailed to a post b battering it with their heads, risking the loss of an eye from the scratching of the desperate cat in th process. Ha ha.

Elias argued that moral standards evolved; to illustrate the point he documented the etiquet guides published by Erasmus and other philosophers. These guides are full of suggestions about tab manners, toilet manners and bedside manners that seem unnecessary to state, but are therefo revealing: 'Don't greet someone while they are urinating or defecating . . . don't blow your nose on the table-cloth or into your fingers, sleeve or hat . . . turn away when spitting lest your saliva fall o someone . . . don't pick your nose while eating.' In short, the very fact that these injunctions neede mentioning implies that medieval European life was pretty disgusting by modern standards. Pink comments: 'These are the kind of directives you'd expect a parent to give to a three-year-old, not great philosopher to a literate readership.' Elias argued that the habits of refinement, self-control an consideration that are second nature to us today had to be acquired. As time went by, peop 'increasingly inhibited their impulses, anticipated the long-term consequences of their actions, an took other people's thoughts and feelings into consideration'. In other words, not blowing your nos on the tablecloth was all one with not stabbing your neighbour. It's a bit like a historical version of th

broken-window theory: intolerance of small crimes leads to intolerance of big ones.

Doux commerce

But how were these gentler habits acquired? Elias realised that we have internalised the punishme for breaking these rules (and the ones against more serious violence) in the form of a sense of sham That is to say, just as Adam Smith argued, we rely on an impartial spectator, and we learned earli and earlier in life to see his point of view as he became ever more censorious. But why? Elias a Pinker give two chief reasons: government and commerce. With an increasingly centralise government focused on the king and his court, rather than local warlords, people had to behave mo like courtiers and less like warriors. That meant not only less violent, but also more refined. Leviath enforced the peace, if only to have more productive peasants to tax. Revenge for murder w nationalised as a crime to be punished, rather than privatised as a wrong to be righted. At the sam time, commerce led people to value the opportunity to be trusted by a stranger in a transaction. Wi increasingly money-based interactions among strangers, people increasingly began to think neighbours as potential trading partners rather than potential prey. Killing the shopkeeper makes n sense. So empathy, self-control and morality became second nature, though morality was always double-edged sword, as likely to cause violence as to prevent it through most of history.

Lao Tzu saw this twenty-six centuries ago: 'The more prohibitions you have, the less virtuo people will be.' Montesquieu's phrase for the calming effect of trade on human violence, intoleranc and enmity was '*doux commerce*' – sweet commerce. And he has been amply vindicated in th centuries since. The richer and more market-oriented societies have become, the nicer people hav behaved. Think of the Dutch after 1600, the Swedes after 1800, the Japanese after 1945, the Germa likewise, the Chinese after 1978. The long peace of the nineteenth century coincided with the grow of free trade. The paroxysm of violence that convulsed the world in the first half of the twentie century coincided with protectionism.

Countries where commerce thrives have far less violence than countries where it is suppresse Does Syria suffer from a surfeit of commerce? Or Zimbabwe? Or Venezuela? Is Hong Kong large peaceful because it eschews commerce? Or California? Or New Zealand? I once interviewed Pinker front of an audience in London, and was very struck by the passion of his reply when an audien member insisted that profit was a form of violence and was on the increase. Pinker simply repli with a biographical story. His grandfather, born in Warsaw in 1900, emigrated to Montreal in 192 worked for a shirt company (the family had made gloves in Poland), was laid off during the Gre Depression, and then, with his grandmother, sewed neckties in his apartment, eventually earni enough to set up a small factory, which they ran until their deaths. And yes, it made a small pro (just enough to pay the rent and bring up Pinker's mother and her brothers), and no, his grandfath never hurt a fly. Commerce, he said, cannot be equated with violence.

'Participation in capitalist markets and bourgeois virtues has civilized the world,' writes Deird McCloskey in her book *The Bourgeois Virtues*. 'Richer and more urban people, contrary to what th magazines of opinion sometimes suggest, are *less* materialistic, *less* violent, *less* superficial than po and rural people' (emphasis in original).

How is it then that conventional wisdom – especially among teachers and religious leaders maintains that commerce is the cause of nastiness, not niceness? That the more we grow the econom

and the more we take part in ‘capitalism’, the more selfish, individualistic and thoughtless w
become? This view is so widespread it even leads such people to assume – against the evidence – th
violence is on the increase. As Pope Francis put it in his 2013 apostolic exhortation *Evangel*
Gaudium, ‘unbridled’ capitalism has made the poor miserable even as it enriched the rich, and
responsible for the fact that ‘lack of respect for others and violence are on the rise’. Well, this is ju
one of those conventional wisdoms that is plain wrong. There has been a decline in violence, not a
increase, and it has been fastest in the countries with the least bridled versions of capitalism – not th
there is such a thing as unbridled capitalism anywhere in the world. The ten most violent countries
the world in 2014 – Syria, Afghanistan, South Sudan, Iraq, Somalia, Sudan, Central African Republi
Democratic Republic of the Congo, Pakistan and North Korea – are all among the least capitalist. Th
ten most peaceful – Iceland, Denmark, Austria, New Zealand, Switzerland, Finland, Canada, Japa
Belgium and Norway – are all firmly capitalist.

My reason for describing Pinker’s account of the Elias theory in such detail is because it is
thoroughly evolutionary argument. Even when Pinker credits Leviathan – government policy – f
reducing violence, he implies that the policy is as much an attempt to reflect changing sensibility as
change sensibility. Besides, even Leviathan’s role is unwitting: it did not set out to civilise, but t
monopolise. It is an extension of Adam Smith’s theory, uses Smith’s historical reasoning, and posit
that the moral sense, and the propensity to violence and sordid behaviour, evolve. They evolve n
because somebody ordains that they should evolve, but spontaneously. The moral order emerges an
continually changes. Of course, it can evolve towards greater violence, and has done so from time
time, but mostly it has evolved towards peace, as Pinker documents in exhaustive detail. In genera
over the past five hundred years in Europe and much of the rest of the world, people became steadi
less violent, more tolerant and more ethical, without even realising they were doing so. It was not unt
Elias spotted the trend in words, and later historians then confirmed it in statistics, that we even kne
it was happening. It happened to us, not we to it.

The evolution of law

It is an extraordinary fact, unremembered by most, that in the Anglosphere people live by laws th
did not originate with governments at all. British and American law derives ultimately from th
common law, which is a code of ethics that was written by nobody and everybody. That is to say
unlike the Ten Commandments or most statute law, the common law emerges and evolves throug
precedent and adversarial argument. It ‘evolves incrementally, rather than leaps convulsively
stagnates idly’, in the words of legal scholar Allan Hutchinson. It is ‘a perpetual work-in-progress
evanescent, dynamic, messy, productive, tantalizing, and bottom up’. The author Kevin Williamso
reminds us to be astonished by this fact: ‘The most successful, most practical, most cherished leg
system in the world did not have an author. Nobody planned it, no sublime legal genius thought it u
It emerged in an iterative, evolutionary manner much like a language emerges.’ Trying to replace th
common law with a rationally designed law is, he jests, like trying to design a better rhinoceros in
laboratory.

Judges change the common law incrementally, adjusting legal doctrine case by case to fit the fac
on the ground. When a new puzzle arises, different judges come to different conclusions about how
deal with it, and the result is a sort of genteel competition, as successive courts gradually choo

which line they prefer. In this sense, the common law is built by natural selection.

Common law is a peculiarly English development, found mainly in countries that are form British colonies or have been influenced by the Anglo-Saxon tradition, such as Australia, Indi Canada and the United States. It is a beautiful example of spontaneous order. Before the Norma Conquest, different rules and customs applied in different regions of England. But after 1066 judg created a common law by drawing on customs across the country, with an occasional nod towards th rulings of monarchs. Powerful Plantagenet kings such as Henry II set about standardising the laws make them consistent across the country, and absorbed much of the common law into the royal court But they did not invent it. By contrast, European rulers drew on Roman law, and in particular compilation of rules issued by the Emperor Justinian in the sixth century that was rediscovered eleventh-century Italy. Civil law, as practised on the continent of Europe, is generally written b government.

In common law, the elements needed to prove the crime of murder, for instance, are contained case law rather than defined by statute. To ensure consistency, courts abide by precedents set b higher courts examining the same issue. In civil-law systems, by contrast, codes and statutes a designed to cover all eventualities, and judges have a more limited role of applying the law to the ca in hand. Past judgements are no more than loose guides. When it comes to court cases, judges in civi law systems tend towards being investigators, while their peers in common-law systems act as arbite between parties that present their arguments.

Which of these systems you prefer depends on your priorities. Jeremy Bentham argued that th common law lacked coherence and rationality, and was a repository of ‘dead men’s thoughts’. Th libertarian economist Gordon Tullock, a founder of the public-choice school, argued that the commo law method of adjudication is inherently inferior because of its duplicative costs, inefficient means ascertaining the facts, and scope for wealth-destroying judicial activism.

Others respond that the civil-law tradition, in its tolerance of arbitrary confiscation by the sta and its tendency to mandate that which it does not outlaw, has proved less a friend of liberty than th common law. Friedrich Hayek advanced the view that the common law contributed to great economic welfare because it was less interventionist, less under the tutelage of the state, and w better able to respond to change than civil legal systems; indeed, it was for him a legal system th led, like the market, to a spontaneous order.

A lot of Britain’s continuing discomfort with the European Union derives from the contra between the British tradition of bottom–up law-making and the top–down Continental version. Th European Parliament member Daniel Hannan frequently reminds his colleagues of the bias toward liberty of the common law: ‘This extraordinary, sublime idea that law does not emanate from the sta but that rather there was a folk right of existing law that even the king and his ministers were subje to.’

The competition between these two traditions is healthy. But the point I wish to emphasise is th it is perfectly possible to have law that emerges, rather than is created. To most people that is surprise. They vaguely assume in the backs of their minds that the law is always invented, rather tha that it evolved. As the economist Don Boudreaux has argued, ‘Law’s expanse is so vast, its nuances s many and rich, and its edges so frequently changing that the popular myth that law is that set of rul designed and enforced by the state becomes increasingly absurd.’

It is not just the common law that evolves through replication, variation and selection. Even civ law, and constitutional interpretation, see gradual changes, some of which stick and some of which d not. The decisions as to which of these changes stick are not taken by omniscient judges, and nor a

they random; they are chosen by the process of selection. As the legal scholar Oliver Goodenoug argues, this places the evolutionary explanation at the heart of the system as opposed to appealing an outside force. Both ‘God made it happen’ and ‘Stuff happens’ are external causes, whereas evolution is a ‘rule-based cause internal to time and space as we experience them’.

3

The Evolution of Life

A mistake I strongly urge you to avoid for all you're worth,
An error in this matter you should give the widest berth:
Namely don't imagine that the bright lights of your eyes
Were purpose made so we could look ahead, or that our thighs
And calves were hinged together at the joints and set on feet
So we could walk with lengthy stride, or that forearms fit neat
To brawny upper arms, and are equipped on right and left
With helping hands, solely that we be dexterous and deft
At undertaking all the things we need to do to live,
This rationale and all the others like it people give,
Jumbles effect and cause, and puts the cart before the horse . . .

Lucretius, *De Rerum Natura*, Book 4, lines 823–33

Charles Darwin did not grow up in an intellectual vacuum. It is no accident that alongside h
scientific apprenticeship he had a deep inculcation in the philosophy of the Enlightenment. Emerge
ideas were all around him. He read his grandfather's Lucretius-emulating poems. 'My studies consi
in Locke and Adam Smith,' he wrote from Cambridge, citing two of the most bottom–up philosopher
Probably it was Smith's *The Moral Sentiments* that he read, since it was more popular in universiti
than *The Wealth of Nations*. Indeed, one of the books that Darwin read in the autumn of 1838 aft
returning from the voyage of the *Beagle* and when about to crystallise the idea of natural selection w
Dugald Stewart's biography of Adam Smith, from which he got the idea of competition and emerge
order. The same month he read, or reread, the political economist Robert Malthus's essay o
population, and was struck by the notion of a struggle for existence in which some thrived and othe
did not, an idea which helped trigger the insight of natural selection. He was friendly at the time wi
Harriet Martineau, a firebrand radical who campaigned for the abolition of slavery and also for th
'marvellous' free-market ideas of Adam Smith. She was a close confidante of Malthus. Through h
mother's (and future wife's) family, the Wedgwoods, Darwin moved in a circle of radicalism, trad
and religious dissent, meeting people like the free-market MP and thinker James Mackintosh. Th
evolutionary biologist Stephen Jay Gould once went so far as to argue that natural selection 'should b
viewed as an extended analogy . . . to the laissez-faire economics of Adam Smith'. In both case
Gould argued, balance and order emerged from the actions of individuals, not from external or divi
control. As a Marxist, Gould surprisingly approved of this philosophy – for biology, but not fo
economics: 'It is ironic that Adam Smith's system of laissez faire does not work in his own domain o