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William Blake, *The Temptation and the Fall of Eve*

*It is a foolish thing to make a long prologue, and to be short
in the story itself.*

II MACCABEES 2:32

When, long ago, I was a student in the Zoology Department of the University of Edinburgh, there stood in a niche on the main staircase a bronze statue of a chimpanzee. The object is still there. The animal wears a perplexed expression as it gazes at a human skull held in its fist. It sits upon a pile of books, one of which bears the name 'Darwin' upon the spine. On

the open page of another volume are incised the words '*Eritis sicut Deus*'. The phrase is a quotation from the third chapter of Genesis, as translated by St Jerome in the fourth century. As the Serpent persuades Eve to pluck the forbidden fruit the creature says: '*Eritis sicut Deus, scientes bonum et malum,*' which the King James Version renders as: 'Ye shall be as gods, knowing good and evil.'

Scientists are no more qualified than anyone else to comment on those two abstractions, but they have gained insights into the physical world rather more dependable than those of the Scriptures. Science (unlike the Serpent) has, in its brief history, lived up to most of its promises. It allows us to answer many of the questions that so mystified that Scottish primate and, as an incidental, gives this book a title.

The double helix and the mushroom cloud have joined the Cross, the Crescent and the Star of David as global icons. Like the ancient scribes, the people who invented those two images seldom ask new questions, but – unlike them – they do quite often come up with new answers. The topics studied by today's physicists, astronomers and biologists have obsessed mankind since long before their subjects began. God himself set problems about how the world works, as in his address to Job: 'Where is the way light dwelleth?', 'Hath the rain a father?', 'Where wast thou when I laid the foundations of the earth? . . . Whereupon are the foundations thereof fastened?' The Book of Proverbs does the same: 'Who hath gathered the wind in his fists; who hath bound the waters in a garment?' The response to such queries was, needless to say, that the universe had been called into being by the Lord himself and that its beauties were

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evidence of his existence, proof that ‘The heavens declare the glory of God; and the firmament sheweth his handiwork’.

That logic is empty, but the questions posed to the unfortunate Job have become the raw material of research. Those who study Nature’s ways today are interested, as were the sages of old, in the origins of the universe, of our planet, of living matter, of species and of mankind; and in the biology of sex and age and the possibility of eternal life – real rather than metaphorical – as against fiery doom in a decaying solar system. The repeated appearance of such themes in sacred texts, the Bible among them, is a reminder that each was a handbook to help comprehend the world and that each in its own way, and in its own day, succeeded.

The Good Book is many other things: a set of laws, some serious and some trivial, a history both real and imagined, a collection of precepts and of poetry, and an extended speculation about the glorious future that awaits those that accept its message. It sits firmly in the genealogy of ideas. Science is its direct descendant and the factual, if not the spiritual, questions asked long ago can be explored with the latest technology. This volume is an attempt to do just that, to scrutinise the biblical pages from the point of view of a scientist. In an attenuated version of its original, it tries to imitate the Testaments by weaving what might seem a series of unrelated facts into a coherent whole.

Religion itself can also be studied by members of my profession, on several levels; in terms of curiosity about this world and the next, and of the universal concern about the welfare of family, of nation, or of life as a whole. Research on

the brain adds to the story, as do individual differences in genes and personality and in the social and intellectual background in which they are placed.

Powerful as the tools of science have proved, plenty of people dispute its findings on grounds of belief while others reject claims based on faith because they deny the truth, or are impossible to test. Even so, the attitude of the globe's billion or so agnostics and atheists to the doctrines of the devout majority has much in common with the views of the pious to the obdurate universe of fact, for each contemplates the other with a mixture of fascination and distaste. The idea that simple conviction can illuminate the physical world is devoid of interest to biologists, geologists and the like. Many who cleave to dogma have an equally negative attitude towards science, for they reject what they see as its claim to be a complete explanation of what surrounds them. As a result, many scientists have a furtive interest in what the fundamentalists are up to, and biblical literalists are often beguiled by science, if only to denounce it.

The twenty-first century has reawakened the serpent of superstition. Many have tried to strangle it while others prefer to stir the creature up. Polemical works for and against the power of belief stream from the press. Some attack its fundamentals while others do the opposite. Their attempts to do so have generated more than a thousand courses in science and religion in American universities (with a few scattered across the arid wastes of British academe).

This book is unlikely to appear on their reading lists, for most of their curriculum is beyond the capability, or logic, of

science itself. In a covert attempt to accept that failing, some try to have a foot in both camps. They suggest that objective analysis can only go so far and that there must be another truth beyond. Alfred Russel Wallace – co-discoverer of natural selection – was certain that *Homo sapiens* had ‘something which he has not derived from his animal progenitors – a spiritual essence or nature . . . [that] can only find an explanation in the unseen universe of Spirit’.

Charles Darwin was dubious about such careless use of his ideas, but in a response to an attack on his colleague’s claim, he noted that such statements were ‘not worse than the prevailing superstitions of the country’ (by which he meant Christianity). There he was right, but more than a century on, many still hold to Wallace’s belief, as restated by Martin Luther King, that ‘Science investigates; religion interprets . . . the two are not rivals.’ The notion that science and doctrine occupy separate, or even complementary, universes and that each provides an equally valid insight into the world seems to me unconvincing and is pursued no further here.

Even so, those involved in science can examine many of the claims made in the Bible in an objective way. *The Serpent’s Promise* is not intended as a statement for or against the joy of sects; as an attack on, or defence of, Christianity or any other creed. My own views on the sublime, such as they are, play almost no part. Instead I attempt to stand back and take a fresh look at the sacred writings in a volume that tries to interpret some of its themes in today’s language. The King James Version is more than six times longer than this work, and I have been obliged to omit many sections, such as the endless

accounts of family trees and tribal battles, and the detailed instructions as to how to deck the Tabernacle.

This book begins, in the tradition of its model, with an account of the covenant between God and Man that began in Eden, with an attempt to trace the global pedigree from the inhabitants of that fabled land and from their real equivalents as revealed by modern biology. Genesis explains how the universe came into being, and I too gallop through history from the Big Bang to modern humankind. Eve's acceptance of the Serpent's promise led to original sin – to inborn imperfection – and biology has given us the ability to identify many of our own strengths and weaknesses even before birth (although the decision about what to do with such information has scarcely moved on since biblical times).

Her great error forced sin and sex to become close companions. That mode of reproduction ensures that life persists whatever the fate of those who transmit it. It means that sex levies a penalty in the currency of age and death. Decay, as a result, strikes us all, and long before it smote the patriarchs.

Soon after their demise, divine irritation with Man's degenerate ways led to the Great Flood, an event that has been tracked down in history even as today's fecklessness threatens us with a successor. The descendants of its few survivors fought among themselves even as they multiplied in number. In time, one chosen group, the Children of Israel, were taken into bondage, but in the Exodus found their way to a promised land, only to flee again after a political upheaval; an experience that the Jews have undergone again and again. DNA shows that every nation has the same history of exile and danger as

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humankind multiplied in number and filled the world. As it did, the Bronze Age Levant boomed and the earliest cities, Babylon included, appeared. They were accompanied by the first epidemics, and in the Book of Leviticus the priesthood set out rules of purity in an attempt to cope with a problem that remains a threat today. They also turned a jaundiced eye on which foods are wholesome and which are not as a reminder that diet is a potent statement of cultural and religious identity (and, as we now know, of health).

Visionaries, from Isaiah to Ezekiel, play a large part in the scriptural narrative and we now understand how some of their experiences arise, how the brain can deceive its owner and – perhaps – what lay behind some of the supposedly supernatural experiences of the biblical prophets and their successors.

The New Testament marks a great shift from the Old for it brings the scriptural narrative much closer to the modern world. Instead of a narrow focus on the doings of a chosen people and their implacable god, the Gospels emphasise altruism and inclusiveness, and the rewards to be gained in heaven by making sacrifices here on Earth in response to Christ's promise of eternal life. To believers, that philosophy explains the origin of devotion, and even of society (sceptics, in contrast, see religion as a confidence trick to concentrate power in the hands of a few). *The Serpent's Promise* ends with an account of today's attempts at a science of faith; and makes the modest proposal that now may be the time for the natural to supplant the supernatural as Man begins to make sense of the universe he inhabits.

About the supernatural itself, neither science nor this book

can say anything. As the mathematician Laplace is said to have responded to Napoleon when the Emperor asked him why there was no mention of the deity in his volume on celestial mechanics: 'I have no need for that hypothesis.' An appeal to a supreme power added nothing to his understanding.

In spite of that succinct advice, Christians often try to accommodate the latest advances into their creed. From the heliocentric universe to the theory of evolution, new discoveries are woven into the texture of belief and used to bolster religion itself (the Big Bang, for example, must have been sparked off by God). Theological arguments of this kind depend on the idea that the existence of a final cause behind the universe can never be rejected. In the end – as Laplace pointed out – untestable mysteries of that kind are of no interest except to those determined to believe them.

The Frenchman's logic makes sense to his intellectual descendants, but would have seemed strange indeed to his predecessors, many of whom saw their task as no more than a step towards a comprehension of divine intent. The Bible plays as a result a large (and often neglected) part in the history of science, for many of its great figures were believers in a sense that modern minds find hard to understand. Isaac Newton was less interested in the 'Book of God's Works' – physics and mathematics – than in the 'Book of God's Words', the Bible. He wrote far more about philosophy than about physics, with a 300,000-word exegesis on the Book of Revelation which tried to prove that the Pope was the Antichrist (and on the way came up with the oddly comforting fact that 'We have no reason to suppose more

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Apocalyptic Whores than one'). The rules of the universe had been set at least in part by an external agent: 'So then gravity may put the planets into motion but without the divine power it could never put them into such a Circulating motion as they have about the Sun.'

In the same way, Robert Boyle, father of chemistry, felt that the human body lives on even after death; 'its atoms are preserv'd in all their Digestions and kept capable of being reunited' (which explained the Resurrection). Robert Hooke, discoverer of the cell, saw the microscope as an attempt to restore the perfection of Man's senses, lost at the Fall, while Joseph Priestley, of oxygen fame, was equally sure that his *History of the Corruptions of Christianity* was worth far more than his research on gases. He hailed the French Revolution as a harbinger of the Second Coming and was forced to flee the mob as a result.

As even Isaac Newton might now be forced to concede, since his day the book of divine works, and that of words, have diverged in an essential way, for the first has moved on while the second has stayed more or less where it was. Reality is a stubborn thing and those who devote their lives to it are often forced to change their minds as the evidence changes. Religion, in contrast, depends on revealed and permanent truths. It evolves only in response to philosophical speculation and social pressure rather than as the result of new discoveries about divine intent. Three centuries after Newton, his most direct descendant, Albert Einstein, saw the Bible as no more than 'a collection of honourable but still primitive legends which are nevertheless pretty childish'.

The notion that physical or chemical laws could confirm its claims, or that they have themselves been put in place by a divine force, is alien to most of those who study them. The rise of scepticism in the United Kingdom (with, according to the 2011 census, a quarter of the population not defining themselves as religious and no more than one in five ever going to church except for weddings and the like) makes it hard to compare the attitudes of believers and their opposites. In the United States, where two thirds of the population trust in God with absolute certainty, half are sure that Jesus will soon return, and a majority say that they would be happier to vote for a Mormon, a Jew, or a homosexual as President than an atheist, the contrast is stark. In a survey of almost a thousand of the nation's top researchers, just two felt that the Bible should be interpreted as a literal truth, compared to a third of their fellow citizens. Two thirds of the American public, in contrast, say that they would continue to hold to a claim made by their Church leaders even if scientists were to disprove it.

In spite of their confidence in its message, their instruction manual has a chequered past. It is seen by many in the tradition of David Hume as 'a book, presented to us by a barbarous and ignorant people, written in an age when they were still more barbarous, and in all probability long after the facts which it relates, corroborated by no concurring testimony, and resembling those fabulous accounts, which every nation gives of its origin'. The first five sections – Genesis, Exodus, Leviticus, Numbers and Deuteronomy – comprise the Torah, which was, some believe, transcribed by Moses

from the word of God. In fact, like its companions, it has multiple sources and was composed over many years. Its chapters are a palimpsest of manuscripts written and edited by known and unknown hands. Parts of the text emerged long after the actions it purports to describe. Some books are in most versions, while others have been excluded. Its tales are often inconsistent (as when, in Genesis, Man is created both before and after the animals). Some are supported by other evidence, while for many the ancient scrolls are the sole indication that the events recorded did happen.

Parts of the biblical message are deeply conservative, others radical. For more than a thousand years the only Christian text available was in Latin, and as most people could not speak that its mysteries were hidden from those told to believe them. The earliest complete English translation was made in 1382. It was suppressed. The first printed copy was that of William Tyndale in 1537. He was martyred for his pains.

A century later James I saw that an authorised edition was preferable to the demotic versions by then in circulation (some of which contained difficult terms such as ‘tyrant’) and sponsored a new translation. The King James Version of 1611 is written in Late Renaissance Newspeak, a language noble but purged of unacceptable ideas. It contained helpful phrases such as ‘The powers that be are ordained by God’ (which confirms that even the worst monarchs have a divine right to rule).

The King James has sold more copies than any other work in English, and in its language and its insight into an ancient and unfamiliar way of life has had a pervasive influence on

Western civilisation. Literature owes it an enormous debt: in Coleridge's phrase, 'intense study of the Bible will keep any writer from being vulgar in point of style'. He was right, and more recent translations, such as the New International Version used in many churches, are by comparison feeble. Their leaden lines dispel much of the mystery that still surrounds the King James and make many of its claims even less convincing than they appear when told in the language of four centuries ago.

Its contents have also had large effects, benign or otherwise, on politics and history. George Washington felt that 'It is impossible rightly to govern the world without God and the Bible' and his successor John Adams imagined that if 'a nation in some distant Region should take the Bible for their only law Book . . . Every member would be obliged in conscience, to temperance, frugality, and industry; to justice, kindness, and charity towards his fellow men . . . What a Eutopia, what a Paradise would this region be.' Some years later, George W. Bush announced that 'I feel like God wants me to run for President.'

The Serpent's Promise is by no means the first attempt to revise that great work. Noah Webster, of American Dictionary fame, was shocked by the lewdness of earlier versions and in his edition men have no stones and women no teats. Fornication has gone, as have legs (which are replaced by limbs). Thomas Jefferson went further, for in his adaptation he considered the miracle stories to be 'a ground work of vulgar ignorance . . . superstitions, factitious, fabrications'. He cut out many of the wonders and dubious additions (and by that he meant the Trinity and the question of Jesus' divinity) in a

search for its essence. The forty-six pages that remained, he was certain, ‘extracted the diamonds from the dunghill’ to give ‘the most sublime and benevolent code of morals which has ever been offered to man’. His successors in the American Conservapedia movement are, in the spirit of the English monarch, even now at work on a similar project, with an attack on the liberal bias they see in modern translations (‘volunteer’ replaces ‘comrade’ throughout).

Many people have also pointed at what they see as objective truths within its pages. Job said that God ‘hangeth the Earth upon nothing’ (which might be a statement of a globe suspended in space) and spoke of the weight of the wind long before the notion that the air had mass, while Jonah fell to mountains at the bottom of the sea when cast overboard, as proof that he was the discoverer of seamounts.

Others interpret its tales in modern terms. The Plagues of Egypt happened around 1500 BC, as the climate warmed. They might have coincided with natural events: perhaps the stagnant Nile suffered an attack of red algae, which forced frogs onto land. Their corpses fed flies and mosquitoes, whose depredations caused animal disease and human boils. Then the Mediterranean island of Thera exploded, with a hail of fire. The rains that followed caused an outbreak of locusts, which blocked out the sun until, in the final disaster, the firstborn died because they ate mouldy and poisonous damp grain. Such claims are plausible and some may even be accurate, but there exists little direct evidence for any of them. Rather than attempting to explain particular scriptural events in detail I try to sketch out the Bible’s larger themes.

My own attempt to reconsider the work is quite free of any taint of originality. I often warn students of the dangers of plagiarism but am myself a serial offender. I have in the past attempted to rewrite, or at least update, the entire oeuvre of Charles Darwin, and to use modern biology to test his ideas (which survive the process remarkably well). This attempt to do the same with the Good Book follows its structure in a less slavish fashion.

The Serpent's Promise is a book about dry fact, not theology (nor, God preserve us, philosophy). Its original has much more interest in the universe of the spirit than in the banalities of the physical world; a truth celebrated by many of its devotees. St Augustine criticised Godless curiosity about the tangible universe as 'the lust of the eyes . . . a vain inquisitiveness dignified with the title of knowledge . . . To satisfy this diseased craving . . . people study the operations of Nature which lie beyond our grasp, when there is no advantage in knowing and the investigators simply desire knowledge for its own sake.' Science is that '*concupiscentia oculorum*'. Unlike its alternatives, it answers questions rather than just asking them. Progress depends on the hope that a theory may be disproved rather than on the acceptance of stated truth. Its enquiries know no limits, none of its explanations is complete, and authority, divine or otherwise, is never enough. Sometimes, as in the downfall of Newton's ideas as the foundation of physics from Higgs boson to cosmos, a whole subject collapses in the face of new evidence, but those whose temple has been thrown down do not wring their hands over the ruins, but dust themselves off and build a new one.

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Its practitioners' most important principle is that they do not know what they will find. Without that admission, their subject could not exist, and humankind would be mired in ancient ignorance. The French physiologist Claude Bernard wrote in his 1865 book *Introduction to the Study of Experimental Medicine* that 'It is better to know nothing than to keep in mind fixed ideas based on theories whose confirmation we constantly seek.' He was right (although it took many years to persuade doctors to follow his advice).

The danger of doctrine is that its adherents seek confirmation of what they know; that their redeemer liveth, that there is no God but God and Muhammad is his prophet, or that one of a variety of other convictions must be true. A little knowledge is a dangerous thing, but certainty is worse. To the scientific method, faith is a vice; to believers, a virtue. In the Epistle to the Hebrews it is defined as 'the substance of things hoped for, the evidence of things not seen'. Such a notion is anathema to science, but central to religion, whose debates are held under the rules of the courtroom rather than the laboratory. A defence lawyer quotes only the evidence that favours his client and rubbishes the opposing case, however strong he can see it to be. A scientist may cling to his favourite theory for perhaps too long, but in the end must accept that he is wrong if the evidence goes against him. Doubting Thomas, who refused to believe in the Resurrection unless he was allowed to insert his hand into Jesus' wounds, was rebuked by the Saviour: 'Thomas, because thou hast seen Me, thou hast believed: blessed are they that have not seen, and yet have believed.' The dubious Thomas would

make an excellent patron saint for scientists, but unfortunately the post has already been filled by St Albert the Great (who, needless to say, saw in the natural world a proof of the existence of God).

In biblical times people asked sensible questions about life, or geology, or the sky at night, and came up with what seemed sensible answers. Almost all were wrong, but their philosophy meant that there was no reason to revise them. Piety is – with its promise of life eternal – for optimists, while science is the home of pessimists, who search for ugly facts with which to destroy their (or at least their rivals') beautiful theories. They have brought doubt to the world and the world has gained as a result.

Not everyone agrees. Whatever the triumphs of modern research, a good portion of humankind still rejects its tenets because they conflict with their own opinions. Instead they prefer Martin Luther's assertion that 'All the articles of our Christian belief are, when considered rationally, impossible and mendacious and preposterous. Faith however, is completely abreast of the situation. It grips reason by the throat and strangles the beast'; a statement which has at least the virtue of honesty.

That way of thinking has given rise to what some see as a new Age of Endarkenment. The word contrasts the seventeenth-century outburst of intellectual creativity with that manifest in today's faith healing, Jesus' face in tomatoes or on toast, and the rest of the medieval clutter which dominates so many lives. Its adherents insist that no attempt to understand the universe that omits the spiritual can be complete, whatever

the advances of biology, chemistry, physics and the rest, which may be why 40 per cent of the United States population – plenty among them students of biology or medicine – deny the truth of evolution (and why more than twice that proportion of Pakistanis, Egyptians and Malaysians agrees).

Millions more reject the notion of man-made climate change because they do not like the idea. I find such views impossible to understand. Why listen to a perjurer paid by the oil industry when discussing global warming, or train to become a biologist and at the same time deny the very foundations of the subject? To do so is like doing a degree in English while rejecting the existence of grammar, or in physics with a rooted objection to gravity: it makes no sense.

I sometimes wonder whether those who pour their inane doctrines into their pupils' ears ever consider the damage they do; not to my profession, but to theirs. Why, when a student begins to learn the simple and credible facts, rather than fantasies, about how life emerged or the atmosphere works, should he swallow anything else that his pastor, his rabbi or his imam has told him? Why build a philosophy based on fixed untruths, when we have so many truths, and so much still to find out? There, science cannot help.

The closer scientists draw to the spiritual the less precise their statements become, but I hope to make the case that reason is a better way to understand the physical universe than is faith; that whatever the historical importance of the latter, or the solace it offers to some, that science is a more consistent, universal and satisfying tool with which to organise human lives. A few may be converted from one view

to another while more will see no reason to change their opinions and some may be no more than irritated by my presumption. Whatever their response, I hope that readers will learn something from this endeavour to put unfamiliar facts into familiar context. The illustrations at the chapter heads are by William Blake, who demonstrates, better than almost anyone else, the power of sacred imagery to move even those who do not share his convictions. Much of his oeuvre itself is based on a radical new interpretation of the Good Book. Blake expels the corrupted God and replaces him with his divine son, and does so with such genius that I forgive him his statement that 'Art is the tree of life: Science is the tree of death.'

My own attempt to emulate his work, feeble as it may be in comparison, flies in the face of scriptural advice; as the Book of Revelation puts it, 'For I testify unto every man that heareth the words of the prophecy of this book, If any man shall add unto these things, God shall add unto him the plagues that are written in this book: And if any man shall take away from the words of the book of this prophecy, God shall take away his part out of the book of life.' *The Serpent's Promise* takes that risk and I await the consequences with interest.