

- **Everything is made of invisible particles.** Lucretius, who disliked technical language, chose not to use the standard Greek philosophical term for these foundational particles, “atoms,” i.e., things that cannot be divided. He deployed instead a variety of ordinary Latin words: “first things,” “first beginnings,” “the bodies of matter,” “the seeds of things.” Everything is formed of these seeds and, on dissolution, returns to them in the end. Immutable, indivisible, invisible, and infinite in number, they are constantly in motion, clashing with one another, coming

together to form new shapes, coming apart, recombining again, enduring.

- **The elementary particles of matter—“the seeds of the things”—are eternal.** Time is not limited—a discrete substance with a beginning and an end—but infinite. The invisible particles from which the entire universe is made, from the stars to the lowliest insect, are indestructible and immortal, though any particular object in the universe is transitory. That is, all the forms that we observe, even those that seem the most durable, are temporary: the building blocks from which they are composed will sooner or later be redistributed. But those building blocks themselves are permanent, as is the ceaseless process of formation, dissolution, and redistribution.

Neither creation nor destruction ever has the upper hand; the sum total of matter remains the same, and the balance between the living and the dead is always restored:

And so the destructive motions cannot hold sway eternally and bury existence forever; nor again can the motions that cause life and growth preserve created things eternally. Thus, in this war that has been waged from time everlasting, the contest between the elements is an equal one: now here, now there, the vital forces conquer and, in turn, are conquered; with the funeral dirge mingles the wail that babies raise when they reach the shores of light; no night has followed day, and no dawn has followed night, which has not heard mingled with those woeful wails the lamentations that accompany death and the black funeral. (2.569–80)

The Spanish-born Harvard philosopher George Santayana called this idea—the ceaseless mutation of forms composed of indestructible substances—“the greatest thought² that mankind has ever hit upon.”

- **The elementary particles are infinite in number but limited in shape and size.** They are like the letters in an alphabet, a discrete set capable of being combined in an infinite number of sentences. (2.688ff.) And, with the seeds of things as with language, the combinations are made according to a code. As not all letters or all words can be coherently combined, so too not all particles can combine with all other particles in every possible manner. Some of the seeds of things routinely and easily hook onto others; some repel and resist one another. Lucretius did not claim to know the hidden code of matter. But, he argued, it is important to grasp that there is a code and that, in principle, it could be investigated and understood by human science.
- **All particles are in motion in an infinite void.** Space, like time, is unbounded. There are no fixed points, no beginnings, middles, or ends, and no limits. Matter is not packed together in a solid mass. There is a void in things, allowing the constitutive particles to move, collide, combine, and move apart. Evidence for the void includes not only the restless motion that we observe all around us, but also such phenomena as water oozing through the walls of caves, food dispersed through bodies, sound passing through walls of closed rooms, cold permeating to the bones.

The universe consists then of matter—the primary particles and all that those particles come together to form—and space, intangible and empty. Nothing else exists.

- **The universe has no creator or designer.** The particles themselves have not been made and cannot be destroyed. The patterns of order and disorder in the world are not the product of any divine scheme. Providence is a fantasy.

What exists is not the manifestation of any overarching plan or any intelligent design inherent in matter itself. No supreme choreographer planned their movements, and the seeds of things did not have a meeting in which they decided what would go where.

But because throughout the universe³ from time everlasting countless numbers of them, buffeted and impelled by blows, have shifted in countless ways, experimentation with every kind of movement and combination has at last resulted in arrangements such as those that created and compose our world. (1.1024–28)

There is no end or purpose to existence, only ceaseless creation and destruction, governed entirely by chance.

- **Everything comes into being as a result of a swerve.** If all the individual particles, in their infinite numbers, fell through the void in straight lines, pulled down by their own weight like raindrops, nothing would ever exist. But the particles do not move lockstep in a preordained single direction. Instead, “at absolutely unpredictable times and places they deflect slightly from their straight course, to a degree that could be described as no more than a shift of movement.” (2.218–20) The position of the elementary particles⁴ is thus indeterminate.

The swerve—which Lucretius called variously *declinatio*, *inclinatio*, or *clinamen*—is only the most minimal of motions, *nec plus quam minimum*. (2.244) But it is enough to set off a ceaseless chain of collisions. Whatever exists in the universe exists because of these random collisions of minute particles. The endless combinations and recombinations, resulting from the collisions over a limitless span of time, bring it about that “the rivers replenish the insatiable sea with plentiful streams of water, that the earth, warmed by the sun’s fostering heat, renews her produce, that the family of animals springs up and thrives, and that the gliding ethereal fires have life.” (1.1031–34)

- **The swerve is the source of free will.** In the lives of all sentient creatures, human and animal alike, the random swerve of elementary particles is responsible for the existence of free will. For if all of motion were one long⁵ predetermined chain, there would be no possibility of freedom. Cause would follow cause from eternity, as the fates decreed. Instead, we wrest free will from the fates.

But what is the evidence that the will exists? Why should we not simply think that the matter in living creatures moves because of the same blows that propel dust motes? Lucretius’ image is the split second on the race track after the starting gate is opened, before the straining horses, frantically eager to move, can actually propel their bodies forward. That split second is the thrilling spectacle of a mental act bidding a mass of matter into motion. And because this image did not quite answer to his whole purpose—because, after all, race horses are precisely creatures driven to move by the blows of their riders—Lucretius went on to observe that though an outside force may strike against a man, that man may deliberately hold himself back.⁶

- **Nature ceaselessly experiments.** There is no single moment of origin, no mythic scene of creation. All living beings, from plants and insects to the higher mammals and man, have evolved through a long, complex process of trial and error. The process involves many false starts and dead ends, monsters, prodigies, mistakes, creatures that were not endowed with all the features that they needed to compete for resources and to create offspring. Creatures whose combination⁷ of organs enables them to adapt and to reproduce will succeed in establishing themselves, until changing circumstances make it impossible for them any longer to survive.

The successful adaptations, like the failures, are the result of a fantastic number of combinations that are constantly being generated (and reproduced or discarded) over an unlimited expanse of time. It is difficult to grasp this point, Lucretius acknowledged, but “what has been created gives rise to its own function.” (4.835) That is, he explained, “Sight did not exist before the birth of the eyes, nor speech before the creation of the tongue.” (4.836–37) These organs were not created in order to fulfill a purposed end; their usefulness gradually enabled the creatures in whom they emerged to survive and to reproduce their kind.

- **The universe was not created for or about humans.** The earth—with its seas and deserts, harsh climate, wild beasts, diseases—was obviously not purpose-built to make our species feel at home. Unlike many other animals, who are endowed at birth with what they need to survive, human infants are almost completely vulnerable: Consider, Lucretius wrote in a celebrated passage, how a baby,⁸ like a shipwrecked sailor flung ashore by fierce waves,

lies on the ground naked, speechless, and utterly helpless as soon as nature has cast it forth with pangs of labor from its mother’s womb into the shores of light. (5.223–25)

The fate of the entire species (let alone that of any individual) is not the pole around which everything revolves. Indeed, there is no reason to believe that human beings as a species will last forever. On the contrary, it is clear that, over the infinite expanses of time, some species grow, others disappear, generated and destroyed in the ceaseless process of change. There were other forms of life before us, which no longer exist; there will be other forms of life after us, when our kind has vanished.

- **Humans are not unique.** They are part of a much larger material process that links them not only to all other life forms but to inorganic matter as well. The invisible particles out of which living things, including humans, are composed are not sentient nor do they come from some mysterious source. We are made of the same stuff that everything else is made of.

Humans do not occupy the privileged place in existence they imagine for themselves: though they often fail to recognize the fact, they share many of their most cherished qualities with other animals. To be sure, each individual is unique, but, thanks to the abundance of matter, the same is true of virtually all creatures: how else do we imagine that a calf recognizes its dam⁹ or the cow her calf? We have only to look attentively at the world around us to grasp that many of the most intense and poignant experiences of our lives are not exclusive to our species.

- **Human society began not in a Golden Age of tranquility and plenty, but in a primitive battle for survival.** There was no original paradisaical time of plenty, as some have dreamed, in which

happy, peaceful men and women, living in security and leisure, enjoyed the fruits of nature's abundance. Early humans, lacking fire, agriculture, and other means to soften a brutally hard existence, struggled to eat and to avoid being eaten.

There may always have been some rudimentary capacity for social cooperation in the interest of survival, but the ability to form bonds and to live in communities governed by settled customs developed slowly. At first there was only random mating—either from mutual desire or from barter or rape—and the hunting and gathering of food. Mortality rates were extremely high, though not, Lucretius noted wryly, as high as they currently are, inflated by warfare, shipwreck, and overeating.

The idea that language was somehow given to humans, as a miraculous invention, is absurd. Instead, Lucretius wrote, humans, who like other animals used inarticulate cries and gestures in various situations, slowly arrived at shared sounds to designate the same things. So too, long before they were able to join together to sing melodious songs, humans imitated the warbling of birds and the sweet sound of a gentle breeze in the reeds and so gradually developed a capacity to make music.

The arts of civilization—not given to man by some divine lawmaker but painstakingly fashioned by the shared talents and mental power of the species—are accomplishments worth celebrating, but they are not unmixed blessings. They arose in tandem with the fear of the gods, the desire for wealth, the pursuit of fame and power. All of these originated in a craving for security, a craving that reaches back to the earliest experiences of the human species struggling to master its natural enemies. That violent struggle—against the wild beasts that threatened human survival—was largely successful, but the anxious, acquisitive, aggressive impulses have metastasized. In consequence, human beings characteristically develop weapons that turn against themselves.

- **The soul dies.** The human soul is made of the same material as the human body. The fact that we cannot physically locate the soul in a particular organ only means that it is made of exceedingly minute particles interlaced through the veins, flesh, and sinews. Our instruments are not fine enough to weigh the soul: at the moment of death, it dissolves “like the case of a wine whose bouquet has evaporated, or of a perfume whose exquisite scent has dispersed into the air.” (3.221–2) We do not imagine that the wine or perfume contains a mysterious soul; only that the scent consists of very subtle material elements, too small to measure. So too of the human spirit: it consists of tiny elements hidden in body's most secret recesses. When the body dies—that is, when its matter is dispersed—the soul, which is part of the body, dies as well.
- **There is no afterlife.** Humans have both consoled and tormented themselves with the thought that something awaits them after they have died. Either they will gather flowers for eternity in a paradisaal garden where no chill wind ever blows or they will be frog-marched before a harsh judge who will condemn them, for their sins, to unending misery (misery that somewhat mysteriously requires them after dying to have heat-sensitive skin, an aversion to cold, bodily appetite and thirst, and the like). But once you grasp that your soul dies along with your body, you also grasp that there can be no posthumous punishments or rewards. Life on this earth is all that human beings have.
- **Death is nothing to us.** When you are dead—when the particles that have been linked together,

to create and sustain you, have come apart—there will be neither pleasure nor pain, longing nor fear. Mourners, Lucretius wrote, always wring their hands in anguish and say, “Never again will your dear children race for the prize of your first kisses and touch your heart with pleasure too profound for words.” (3.895–98) But they do not go on to add, “You will not care, because you will not exist.”

- **All organized religions are superstitious delusions.** The delusions are based on deeply rooted longings, fears, and ignorance. Humans project images of the power and beauty and perfect security that they would like to possess. Fashioning their gods accordingly, they become enslaved to their own dreams.

Everyone is subject to the feelings that generate such dreams: they wash over you when you look up at the stars and start imagining beings of immeasurable power; or when you wonder if the universe has any limits; or when you marvel at the exquisite order of things; or, less agreeably,¹⁰ when you experience an uncanny string of misfortunes and wonder if you are being punished; or when nature shows its destructive side. There are entirely natural explanations for such phenomena as lightning and earthquakes—Lucretius spells them out—but terrified humans instinctively respond with religious fear and start praying.

- **Religions are invariably cruel.** Religions always promise hope and love, but their deep, underlying structure is cruelty. This is why they are drawn to fantasies of retribution and why they inevitably stir up anxiety among their adherents. The quintessential emblem of religion—and the clearest manifestation of the perversity that lies at its core—is the sacrifice of a child by a parent.

Almost all religious faiths incorporate the myth of such a sacrifice, and some have actually made it real. Lucretius had in mind the sacrifice of Iphigenia by her father Agamemnon, but he may also have been aware of the Jewish story of Abraham and Isaac and other comparable Near Eastern stories for which the Romans of his times had a growing taste. Writing around 50 BCE he could not, of course, have anticipated the great sacrifice myth that would come to dominate the Western world, but he would not have been surprised by it or by the endlessly reiterated, prominently displayed images of the bloody, murdered son.

- **There are no angels, demons, or ghosts.** Immaterial spirits of any kind do not exist. The creatures with which the Greek and Roman imagination populated the world—Fates, harpies, daemons, genii, nymphs, satyrs, dryads, celestial messengers, and the spirits of the dead—are entirely unreal. Forget them.
- **The highest goal of human life is the enhancement of pleasure and the reduction of pain.** Life should be organized to serve the pursuit of happiness. There is no ethical purpose higher than facilitating this pursuit for oneself and one’s fellow creatures. All the other claims—the service of the state, the glorification of the gods or the ruler, the arduous pursuit of virtue through self-sacrifice—are secondary, misguided, or fraudulent. The militarism and the taste for violent sports that characterized his own culture seemed to Lucretius in the deepest sense perverse and unnatural. Man’s natural needs are simple. A failure to recognize the boundaries of these needs leads human beings to a vain and fruitless struggle for more and more.

Most people grasp rationally that the luxuries they crave are, for the most part, pointless and do little or nothing to enhance their well-being: “Fiery fevers quit your body no quicker, if you toss in embroidered attire of blushing crimson, than if you must lie sick in a

common garment.” (2.34–36) But, as it is difficult to resist fears of the gods and the afterlife, so too it is difficult to resist the compulsive sense that security, for oneself and one’s community, can somehow be enhanced through exploits of passionate acquisitiveness and conquest. These exploits, however, only decrease the possibility of happiness and put everyone engaged in them at the risk of shipwreck.

The goal, Lucretius wrote in a celebrated and famously disturbing passage, must be to escape from the whole mad enterprise and observe it from a position of safety:

It is comforting,¹¹ when winds are whipping up the waters of the vast sea, to watch from land the severe trials of another person: not that anyone’s distress is a cause of agreeable pleasure; but it is comforting to see from what troubles you yourself are exempt. It is comforting also to witness mighty clashes of warriors embattled on the plains, when you have no share in the danger. But nothing is more blissful than to occupy the heights effectively fortified by the teaching of the wise, tranquil sanctuaries from which you can look down upon others and see them wandering everywhere in their random search for the way of life, competing for intellectual eminence, disputing about rank, and striving night and day with prodigious effort to scale the summit of wealth and to secure power. (2:1–13)

- **The greatest obstacle to pleasure is not pain; it is delusion.** The principal enemies of human happiness are inordinate desire—the fantasy of attaining something that exceeds what the finite mortal world allows—and gnawing fear. Even the dreaded plague, in Lucretius’ account—and his work ends with a graphic account of a catastrophic plague epidemic in Athens—is most horrible not only for the suffering and death that it brings but also and still more for the “perturbation and panic” that it triggers.

It is perfectly reasonable to seek to avoid pain: such avoidance is one of the pillars of his whole ethical system. But how is it possible to keep this natural aversion from turning into panic, panic that only leads to the triumph of suffering? And, more generally, why are humans so unhappy?

The answer, Lucretius thought, had to do with the power of the imagination. Though they are finite and mortal, humans are gripped by illusions of the infinite—infinite pleasure and infinite pain. The fantasy of infinite pain helps to account for their proneness to religion: in the misguided belief that their souls are immortal and hence potentially subject to an eternity of suffering, humans imagine that they can somehow negotiate with the gods for a better outcome, an eternity of pleasure in paradise. The fantasy of infinite pleasure helps to account for their proneness to romantic love: in the misguided belief that their happiness depends upon the absolute possession of some single object of limitless desire, humans are seized by a feverish, unappeasable hunger and thirst that can only bring anguish instead of happiness.

Once again it is perfectly reasonable to seek sexual pleasure: that is, after all, one of the body’s natural joys. The mistake, Lucretius thought, was to confound this joy with a delusion, the frenzied craving to possess—at once to penetrate and to consume—what is in reality a dream. Of course, the absent lover is always only a mental image and in this sense akin to a

dream. But Lucretius observed in passages of remarkable frankness that in the very act of sexual consummation lovers remain in the grip of confused longings that they cannot fulfill:

Even in the hour of possession the passion of the lovers fluctuates and wanders in uncertainty: they cannot decide what to enjoy first with their eyes and hands. They tightly squeeze the object of their desire and cause bodily pain, often driving their teeth into one another's lips and crushing mouth against mouth. (4.1076–81)

The point of this passage—part of what W. B. Yeats called “the finest description ¹² of sexual intercourse ever written”—is not to urge a more decorous, tepid form of lovemaking. It is to take note of the element of unsated appetite ¹³ that haunts even the fulfillment of desire. The insatiability of sexual appetite is, in Lucretius' view, one of Venus' cunning strategies; it helps to account for the fact that, after brief interludes, the same acts of love are performed again and again. And he understood too that these repeated acts are deeply pleasurable. But he remained troubled by the ruse, by the emotional suffering that comes in its wake, by the arousal of aggressive impulses, and, above all, by the sense that even the moment of ecstasy leaves something to be desired. In 1685, the great poet John Dryden brilliantly captured Lucretius' remarkable vision:

... when the youthful pair ¹⁴ more closely join,
When hands in hands they lock, and thighs in thighs they twine;
Just in the raging foam of full desire,
When both press on, both murmur, both expire,
They grip, they squeeze, their humid tongues they dart,
As each would force their way to th' others heart.
In vain; they only cruise about the coast.
For bodies cannot pierce, nor be in bodies lost,
As sure they strive to be, when both engage
In that tumultuous momentary rage.
So tangled in the nets of love they lie,
Till man dissolves in that excess of joy.

(4.1105–14)

- **Understanding the nature of things generates deep wonder.** The realization that the universe consists of atoms and void and nothing else, that the world was not made for us by a providential creator, that we are not the center of the universe, that our emotional lives are no more distinct than our physical lives from those of all other creatures, that our souls are as material and as mortal as our bodies—all these things are not the cause for despair. On the contrary, grasping the way things really are is the crucial step toward the possibility of happiness. Human insignificance—the fact that it is not all about us and our fate—is, Lucretius

insisted, the good news.

It is possible for human beings to live happy lives, but not because they think that they are the center of the universe or because they fear the gods or because they nobly sacrifice themselves for values that purport to transcend their mortal existence. Unappeasable desire and the fear of death are the principal obstacles to human happiness, but the obstacles can be surmounted through the exercise of reason.

The exercise of reason is not available only to specialists; it is accessible to everyone. What is needed is to refuse the lies proffered by priests and other fantasymongers and to look squarely and calmly at the true nature of things. All speculation—all science, all morality, all attempts to fashion a life worth living—must start and end with a comprehension of the invisible seeds of things: atoms and the void and nothing else.

It might seem at first that this comprehension would inevitably bring with it a sense of cold emptiness, as if the universe had been robbed of its magic. But being liberated from harmful illusions is not the same as disillusionment. The origin of philosophy, it was often said in the ancient world, was wonder: surprise and bafflement led to a desire to know, and knowledge in turn laid the wonder to rest. But in Lucretius' account the process is something like the reverse: it is knowing the way things are that awakens the deepest wonder.