LUCRETIUS

ON THE NATURE OF THINGS

Translated, with Introduction and Notes,
by MARTIN FERGUSON SMITH

Hackett Publishing Company, Inc.
Indianapolis/Cambridge

Printed in the United States of America

06 05 04 03 02 01 1 2 3 4 5 6 7

For further information, please address:

Hackett Publishing Company, Inc.
P.O. Box 44937
Indianapolis, IN 46244-0937

www.hackettpublishing.com

Cover design by Listenberger & Associates

Library of Congress Cataloging-in-Publication Data

Lucretius Carus, Titus.
[De rerum natura. English]
On the nature of things / Lucretius ; translated, with introduction and notes, by Martin Ferguson Smith.
p. cm.
Includes bibliographical references and index.
ISBN 0-87220-588-6 (cloth) ISBN 0-87220-587-8 (paper)
1. Didactic poetry, Latin Translations into English. 2. Philosophy, Ancient Poetry. I. Smith, Martin Ferguson. II. Title.

PA6483.E5 S6 2001
187- -dc21

2001026403

ON THE NATURE OF THINGS

BOOK ONE

NOTA BENE: What follows is an abridged version of BOOK I of the philosophical poem by Lucretius “On the Nature of Things”. Only select passages are presented, and each passage is accompanied by a brief description of its content. This should help you better understand and navigate an otherwise difficult and dense text.

The philosophical poem "On The Nature of Things", Book I, begins with an invocation of the Goddess Venus. Lucretius asks Venus to help him write a great poem for his friend Memmius.

Mother of Aeneas' people, delight of human beings and the gods, Venus,[1] power of life, it is you who beneath the sky's sliding stars inspirit the ship-bearing sea, inspirit the productive land. To you every kind of living creature owes its conception and first glimpse of the sun's light. You, goddess, at your coming hush the winds and scatter the clouds; for you the creative earth thrusts up fragrant flowers; for you the smooth stretches of the ocean smile, and the sky, tranquil now, is flooded with effulgent light.

1. **1–43:** Venus in this opening passage is a remarkably complex figure. She is the goddess of love and fertility from whose union with Anchises Aeneas, the legendary ancestor of the Romans, was born (see line 1), and she is the lover of Mars, god of war and father of Romulus and Remus (see 31–40). In addressing her, Lucr. may be conscious also of her being the patron goddess of Memmius' *gens* (clan), and certainly he means us to think of the cosmic theory of Empedocles, his model as a philosopher-poet: Empedocles assumed the existence of two motive-forces, Love and Strife, under whose influence his four elements unite and separate, and in Lucr.'s preface Venus symbolizes the creative forces in the world, while Mars (whom he calls *Mavors*, probably in order to underline his connection with *mors*, death) represents the destructive forces. She also personifies pleasure, the attainment of which, according to Epicureans,

Once the door to spring is flung open and Favonius'[2] fertilizing breeze, released from imprisonment, is active, first, goddess, the birds of the air, pierced to the heart with your powerful shafts, signal your entry. Next wild creatures and cattle bound over rich pastures and swim rushing rivers: so surely are they all captivated by your charm and eagerly follow your lead. Then you inject seductive love into the heart of every creature that lives in the seas and mountains and river torrents and bird-haunted thickets and verdant plains, implanting in it the passionate urge to reproduce its kind.

Since you and you alone stand at the helm of nature's ship, and since without your sanction nothing springs up into the shining shores of light, nothing blossoms into mature loveliness, it is you whom I desire to be my associate in writing this poem *On the Nature of Things,* which I am attempting to compose for my friend Memmius.[3] Through your will, goddess, he is always endowed outstandingly with all fine qualities. So with all the more justification, Venus, give my words charm that will ensure their immortality.

is the object of human life. It is to be noted that she is addressed not only as the power of physical creation and as the source of physical beauty, but also as the inspirer of poetic productivity and beauty (see 21–28), and it is significant that Lucr.'s proclamation of his originality as a poet with a philosophical theme (1.921 ff.) includes several echoes of the invocation to Venus: see my discussion in *Hermathena* 102 (1966) 73–83, at 80–81. In the same article I draw attention also to parallelisms between the invocation to Venus and the address to Epicurus at the beginning of Book 3 (1–30)—parallelisms which both reflect and reinforce Lucr.'s view that, just as Venus is the bringer of life, light, and calm into the physical world, so Epicurus is the bringer of light and calm into the spiritual world. 1–25 are imitated by Spenser in *The Faerie Queene* 4.10.44–47; and the description of Venus and Mars influenced Byron in *Childe Harold's Pilgrimage* 4.51 and probably, through Politian, Botticelli's *Mars and Venus.*

2. **11:** West wind.
3. **26:** On Memmius, see pp. xiii–xiv, xvii.

A brief description of the topics of Book I is provided.

As for what follows, Memmius, lend open ears and an alert mind, released from cares, to true philosophy. My gifts have been arranged for you with steadfast zeal; be sure that you do not contemptuously discard them without having understood them. For I will proceed to explain to you the working of the heaven above and the nature of the gods, and will unfold the primary elements of things[6] from which nature creates, increases, and sustains all things, and into which she again resolves them when they perish. In expounding our philosophy I often call these elements "matter" or "generative particles of things" or "seeds of things"; and, since they are the ultimate constituents of all things, another term I often use is "ultimate particles."

When all could see that human life lay groveling ignominiously in the dust, crushed beneath the grinding weight of superstition, which from the celestial regions displayed its face, lowering over mortals with hideous scowl, the first who dared to lift mortal eyes to challenge it, the first who ventured to confront it boldly, was a Greek.[7] This man neither the reputation of the gods nor thunderbolts nor heaven's menacing rumbles could

4. **42–43:** A probable allusion to Memmius' praetorship of 58 B.C.

5. **44–49:** These lines occur also at 2.646–651. There they are well adjusted to their context, but in the present passage they come in abruptly and inappropriately. How is their appearance to be explained? There are two possibilities: one is that Lucr. himself wrote them here but did not live to use them or delete them (in the same way that he did not live to delete 4.45–53); the other is that an early commentator, considering the lines in Book 2 relevant to, and perhaps inconsistent with, the invocation to Venus, quoted them, and that the quotation then found its way into the text. The passage is closely related to Epicurus *PD* 1. On the Epicurean conception of the gods, see pp. xxviii–xxix.

6. **55:** The atoms.

7. **66:** Epicurus.

daunt; rather all the more they roused the ardor of his courage and made him long to be the first to burst the bolts and bars of nature's gates. And so his mind's might and vigor prevailed, and on he marched far beyond the blazing battlements of the world,[8] in thought and understanding journeying all through the measureless universe; and from this expedition he returns to us in triumph with his spoils knowledge of what can arise and what cannot, and again by what law each thing has its scope restricted and its deeply implanted boundary stone.[9] So now the situation is reversed: superstition is flung down and trampled underfoot; we are raised to heaven by victory.

The author points out that religion is often the source of evil, not philosophy.

In this connection, I fear that you may perhaps imagine that you are starting on the principles of an irreligious philosophy and setting out on a path of wickedness. But in fact more often it is that very superstition that has perpetrated wicked and irreligious deeds. Consider how at Aulis the elite of Greece's chieftains, the flower of its manhood, foully polluted the altar of the Virgin Goddess of the Crossroads with the blood of Iphianassa.[10] As soon as the ribbon[11] had been fastened about her virgin locks so that it flowed down either cheek in equal lengths, and as soon as she had noticed her father standing sorrowfully before the altars, and near him attendants trying to keep the knife concealed, and the people moved at the sight of her to streaming tears, struck dumb with dread and sinking on her knees, she groped for the ground. Poor girl! Little could it help her at such a time that she had been the first to give the king the name of father. For uplifted by masculine hands, she was led, trembling with terror, to the altars. Instead of being escorted by the wedding hymn's cheerful ring, when the solemn service of sacrifice had been performed, she was to be immolated by her father and fall a sorrowful and sinless victim of a sinful crime, cheated of the marriage for which

8. **73:** The reference is to the fiery envelope that, according to the Epicureans, surrounds the world, but there is also the idea of Epicurus being a victorious general, who, in storming the city, sets its walls ablaze.

9. **76–77:** Repeated at 595–596, 5.89–90, 6.65–66. The metaphor of the boundary stone, which occurs also at 2.1087, is used to emphasize the fundamental Epicurean principle that the powers of everything are governed and limited by an inviolable law of nature.

10. **84–86:** Agamemnon, commander-in-chief of the Greek expedition to Troy, sacrificed his own daughter Iphianassa (or Iphigenia) to Artemis, the Roman Diana (the Virgin Goddess of the Crossroads), in order to appease the anger of the goddess, who was delaying his fleet with contrary winds at Aulis, a port of Boeotia. Iphigenia was told that she was being brought to Aulis to marry Achilles.

11. **87:** The mark of a sacrificial victim.

she was just ready. And all to what purpose? To enable a fleet to receive the blessing of a prosperous and propitious departure. Such heinous acts could superstition prompt.[12]

12. **101:** A famous line (*tantum religio potuit suadere malorum*), which Voltaire predicted would last as long as the world.

13. **102:** "Fable-mongers" here and at 109 translates the derogatory *vatum*, which refers to those who, whether poets or priests, are professional promoters of traditional religion and mythology.

14. **115:** The lower world.

15. **116:** A reference to the doctrine of metempsychosis, held by the Pythagoreans, Empedocles, and Ennius.

16. **117–118:** On Ennius and Lucr.'s debt to him, see pp. x, xi. The typically Lucretian play on words "Ennius . . . perennial" (Latin *Ennius . . . perenni*) reflects and reinforces the point that Ennius' work is undying. Helicon is a mountain in Boeotia, sacred to the Muses.

17. **120:** A river in the underworld; hence the underworld itself.

140

The main bulk of BOOK I is devoted to explaining the principles of "atomistic philosophy". The author begins by stating and defending the FIRST principle of his atomistic philosophy, that is, nothing comes from nothing.

The first stage of this study will have this rule as its basis: nothing ever 150
springs miraculously out of nothing. The fact is that all mortals are in the grip of fear, because they observe many things happening on earth and in the sky and, being at a complete loss for an explanation of their cause, suppose that a supernatural power is responsible for them. Therefore, as soon as we have seen that nothing can be created out of nothing, we shall have a clearer view of the object of our search, namely the explanation of the source of all created things and of the way in which all things happen independently of the gods.

If things could be created out of nothing, any kind of thing could be 160
produced from any source; nothing would need a seed. In the first place, human beings could spring from the sea, squamous fish from the ground, and birds could be hatched from the sky; cattle and other farm animals and every kind of wild beast would bear young of unpredictable species,

18. **131:** The bulk of Book 3 is devoted to demonstration of the corporeal and mortal nature of the mind (*animus*) and spirit (*anima*), the rational and irrational parts of the soul.

19. **132–133:** The reference is to the filmy "images" discharged from the surfaces of objects. Their existence and nature are demonstrated in Book 4. See pp. xxvii xxviii.

20. **139:** Lucr. mentions this difficulty again at 832 and 3.260.

21. **140–145:** On the significance of these important lines, see p. xiii.

22. **146–148:** Repeated at 2.59 61, 3.91–93, 6.39 41.

and would make their home in cultivated and barren parts without discrimination. Moreover, the same fruits would not invariably grow on the same trees, but would change: any tree could bear any fruit. Seeing that there would be no elements with the capacity to generate each kind of thing, how could creatures constantly have a fixed mother? But as it is, because all are formed from fixed seeds, each is born and issues out into the shores of light only from a source where the right matter and the right ultimate particles exist. And this explains why all things cannot be produced from all things: any given thing possesses a distinct creative capacity.

A second point: why do we see the rose bursting out in spring, the corn in scorching summer, the vine at autumn's coaxing, if it is not because, only when the fixed seeds of things have streamed together at their appropriate time, is any created thing uncovered, while the attendant seasons assist the prolific earth to deliver the frail objects into the shores of light in safety? But if they were produced from nothing, they would suddenly spring up at unpredictable intervals and at unfavorable times of the year, for there would be no ultimate particles that could be debarred by the unpropitious season from entering into creative union. Moreover, so far as growth is concerned, the lapse of time required for the confluence of seed would be unnecessary, if things could arise out of nothing. Children, too young to talk, in an instant would become young adults, and trees would suddenly bound up out of the ground. But it is evident that none of these things happens, since in every case growth is a gradual process, as one would expect, from a fixed seed and, as things grow, they preserve their specific character; so you may be sure that each thing increases its bulk and derives its sustenance from its own special substance.

23. **196–198:** Lucr. is fond of this illustration: see 823–829, 907–914, 2.688–699, 1013–1022. Conveniently, the Latin word *elementa* can mean "letters of the alphabet" as well as "elements."

210

The author continues by stating and defending the SECOND principle of his atomistic philosophy, that is, nothing is reduced into nothing.

The complement of the foregoing doctrine is the principle that, although nature resolves everything into its constituent particles, she never annihilates anything. For if anything were subject to destruction in all its parts, anything might be whisked out of sight in a flash and cease to exist: no force would be needed to effect the dispersion of its parts by unraveling its interlaced fabric. But as it is, because all things are composed of imperishable seeds, nature does not allow us to witness the destruction of anything until it has encountered a force that dashes it to pieces or works its way inside through the interstices and so breaks it up.

Moreover, if time wholly destroys the things it wastes and sweeps away, and engulfs all their substance, whence does Venus escort each kind of creature back into the light of life? Or, when this is done, from what store does the creative earth furnish the food to sustain and strengthen each? From what source is the sea provided with an unfailing supply of water by its native springs and by the rivers that rise far beyond its bounds? Where does the ether find fuel to feed the stars? For everything of perishable substance must inevitably have been swallowed up by the sweep of infinite time and days that are no more. But if through that space of ages past the elements that compose and reshape the universe have survived, it is certain that they are endowed with an immortal nature. Therefore it is impossible for anything to return to nothing.

Furthermore, the same force would cause the destruction of all things without exception, if there were no imperishable substance, more or less closely interwoven, to give them stability. The fact is that a mere touch would be enough to cause their death, since there would be no imperishable elements to form a web that in each case could be unwoven only by a real force. But as it is, because the elements are interwoven in various ways, and their matter is imperishable, things survive intact until they encounter a force sharp enough to unweave their particular fabric. Noth-

ing, therefore, returns to nothing, but everything dissolves and returns to the elements of matter.

Lastly, the rains disappear, when father sky has sent them spurting down into the lap of mother earth;[24] but crops spring up and show a sheen, branches clothe themselves with green leaves, and trees grow and become heavy with fruit. This is what provides the human race and beasts with nourishment; this is what gives us the happy sight of cities blooming with children, and leafy woodlands full of the song of new-hatched birds; this is what causes cattle and sheep, exhausted by their very plumpness, to lie down in luxuriant pastures, and white moist milk to ooze from distended udders; this is what enables newborn creatures to frisk and play on unsteady legs in the tender grass, their young minds intoxicated with neat milk.[25]

And so no visible object ever suffers total destruction, since nature renews one thing from another, and does not sanction the birth of anything unless she receives the compensation of another's death.

The author continues by noting that what exists is often invisible.

Now then, I have taught that things cannot be produced from nothing, and also that, once born, they cannot be reduced to nothing. But in case you are beginning to treat my words with skepticism because the elements of things are imperceptible to our eyes, let me draw your attention to other particles that, though invisible, have undeniable reality.

In the first place, the wild wind awakened whips the waves of the sea, capsizes huge ships, and sends the clouds scudding; sometimes it swoops and sweeps across the plains in tearing tornado, strewing them with great trees, and hammers the heights of mountains with forest-splitting blasts. Such is the frenzied fury of the wind, when it shrieks shrill, rages, and menacingly murmurs. Undoubtedly, therefore, there are invisible particles of wind that sweep the sea, sweep the lands, sweep the clouds in the sky, buffeting and battering them with swirling suddenness. The flow of their current and the devastation they deal is no different from that of a river in sudden spate: water is by nature soft, but when swollen by a great deluge racing down from high mountains after heavy rains, it rams together debris of forests and whole trees; even sturdy bridges cannot withstand the sudden shock of the advancing flood, so furious is the force

24. **250–251:** Lucr. again (as in the opening lines of the poem) exploits mythology for his poetic and philosophical purposes. The story of the marriage of earth and sky is an old one. The poet returns to it in 2.991–998, a passage that seems to have been influenced by Euripides.

25. **259–261:** Serious in his love of animals but lighthearted in his writing here, Lucr. suggests that the reason for the unsteadiness and playfulness of the newborn creatures is that their mothers' milk has the intoxicating effect of neat wine.

with which the river, made to boil by bulk of rain, dashes against the piles; with thundering roar it deals destruction, rolling big boulders beneath its waves and sweeping away all that obstructs its course. This, then, is the way in which currents of wind also must operate: when, with the strength of a river, they have pounced in any direction, they chase things before them and sweep them away in attack after attack and sometimes, swooping upon them in swirling eddy, whirl them around and carry them off in a swift tornado. So I insist that there are invisible particles of wind, since in their effects and behavior they are found to rival great rivers, whose substance is manifest.[26]

Then again, we smell the various odors of things, even though we never see them approaching our nostrils; we do not observe seething heat, nor can we discern cold with our eyes, nor do we see sounds; and yet all these must be of a corporeal nature, since they have the power to act upon our sensory organs. For nothing can touch or be touched, unless it is corporeal.

Moreover, garments hung up on a wave-plashed shore grow damp, and the same garments spread out in the sun grow dry. Yet we do not see how the moisture has soaked them through, nor again how it has withdrawn under the influence of the heat. Therefore the moisture is sprayed out in the form of tiny particles that are completely invisible to our eyes.

Furthermore, as the sun completes many annual circuits, a finger ring is worn thin on the inside; the fall of water drop by drop hollows a stone; the curved plowshare, though made of iron, imperceptibly suffers attrition in the fields; we see the stone pavements of streets worn away by the feet of the crowd; and the bronze statues by city gates display right hands rubbed thin by the frequent reverential touch of passersby. We observe, then, that all these objects, being worn away, are losing substance; but our inadequate faculty of sight has debarred us from being shown what particles are departing at any particular moment.

26. **271–297:** The argument that the existence of invisible atoms is believable, because the invisible wind has visible effects equal to those of water, which is visible, is brilliantly conceived and presented. On the elaborate correspondences between the simile (the description of the river in flood) and the context (the description of the wind), see especially D. West, *Philologus* 114 (1970) 272–274.

The author then argues that void must exist besides matter, or else movement would be impossible. This is the THIRD principle of atomistic philosophy.

Yet it is not true that everything is packed solid and confined on every side by corporeal substance; for there is void in things. Knowledge of this fact will stand you in good stead in many connections; it will prevent you from straying in uncertainty, from continually questioning about the universe, and from treating my words with skepticism. There is, then, intangible space, void, and vacuity. Otherwise, movement would be absolutely impossible. For the obvious province of matter, namely to prevent[27] and obstruct, would operate against all things all the time, with the result that nothing could advance because nothing would begin to give way. But as it is, throughout the seas and lands and heights of heaven we plainly perceive countless things moving in countless different ways; whereas if void did not exist, things would not so much be robbed and deprived of restless motion, as could never under any circumstances have been produced at all, since on every side matter would be packed solid in a motionless mass.

Moreover, no matter how solid things may appear to be, they are in fact of a porous consistency, as you may perceive from the following examples. In caverns moist streams of water seep through, making the rocks all weep with an abundance of drops. Food distributes itself into every part of an animal's body. Trees grow and produce a profusion of fruit in season, because their sustenance is diffused right through them from the deepest roots, up through the trunks, and into every branch. Sounds penetrate partitions and wing their way through the walls of houses. Numbing cold permeates to our very bones. But you could not possibly perceive these things happening if there were no empty spaces that the various particles could use as passages.

Lastly, why, in the case of objects of identical bulk, do we observe that some weigh more than others? If a ball of wool and a lump of lead contain an equal quantity of matter, the two ought to be of equal weight, because it is the function of matter to press everything downward, whereas void by nature is invariably weightless. So an object which is evidently lighter than another of equal bulk without doubt shows plainly that it contains more void; conversely, the heavier object indicates that it contains more matter and much less vacuity. Therefore it is indisputable that, as I have been seeking to prove by penetrative reasoning, what we term void exists as an ingredient in things.

27. **336–337:** The translation "province . . . prevent" is an inadequate attempt to reproduce the pun *officium . . . officere.*

28. **370–371:** The theory that Lucr. goes on to refute was held by Empedocles,

In what follows the author defends what we might call a "materialistic thesis", that is, there is nothing besides matter and void. This is the FOURTH principle of atomistic philosophy.

But now, to resume the work of weaving the web of my argument, the universe in its essential nature is composed of two things, namely matter and the void in which matter is located and moves in every direction. The existence of matter is proved by universal sensation; and unless in the first place trust in sensation is established as an unshakeable foundation,[31] there will be no criterion to which we can refer in the case of things hidden from view in order to verify any matter by reasoning. Then again, if there were no room and space —void, as we call it— matter could not be located anywhere, and its movement in any direction would be absolutely impossible. This is the point I explained to you a little while ago.[32] Besides these nothing exists that you could declare to be distinct and divorced from both matter and void, whose discovery would involve the existence of a kind of third constituent. For whatever exists must be something in its own right; and if it is susceptible of even the lightest and faintest touch, its very existence ensures that it will increase the aggregate of matter by an amount either great or small and augment the total sum. But if it is intangible, having no ability to prevent anything from passing through it in any direction, then undoubtedly it will be that empty space which we call void.

Moreover, whatever exists as a separate entity will either act upon something or submit to being acted upon by other things, or its nature will be such that things can exist and happen in it. But nothing can act or be acted upon, unless it is corporeal; and again, nothing except void and vacuity can provide space.

Therefore, apart from void and matter, no third constituent with a separate existence can be allowed to remain in the aggregate of things, such as might at any time be perceived by our senses or apprehended by the exercise of reason.

31. **422–425:** Sensation, according to the Epicureans, is the primary standard of truth. Cf. 693–700, 4.478–521, and see pp. xxiv–xxv.

32. **429:** 335–345, 370–383.

450

460

470

480

The author here defends the FIFTH principle of his atomistic philosophy, namely that indivisible particles of matter (i.e. atoms) must exist in void.

My next contention is that two kinds of bodies are to be distinguished: there are primary elements of things, and objects compounded of primary elements. As for the primary elements, no force has power to extinguish them, for the solidity of their substance assures them of victory in the end. And yet it seems difficult to believe that it is possible to

33. **449–482:** On properties and accidents, see also Epicurus *Hdt.* 40, 68–73.
34. **464:** Helen of Troy.
35. **474:** Paris.
36. **476:** The citadel of Troy.

find any body composed of solid matter. For the thunderbolt from the sky penetrates the walls of houses, as do voices and sounds; iron grows white-hot in the furnace, and rocks exposed to the ferocity of fervent fire splinter apart; gold, for all its firmness, is dissolved and liquefied by heat, and icy bronze, mastered by the flame, melts; warmth and penetrating cold filter through silver, as is proved by our experience of first one, then the other, when, in accordance with custom, we hold cup in hand while sparkling water is poured in from above. Such is the strength of the evidence that the universe seemingly contains nothing solid. But true reasoning about the nature of things cannot be defied; so give me your attention while in the space of a few verses I prove that bodies composed of solid and indestructible matter do exist. It is these which, according to our teaching, are the seeds and primary elements of things, the constituents and components of the universe.

In the first place, since our investigations have shown that the two elements, matter and the void in which all things happen, have two completely different natures, each must be an independent, uncompounded entity. For wherever there is empty space, which we term void, there is no matter; and again, wherever matter is stationed, under no circumstances is there empty void. It follows that the ultimate particles are solid and contain no void.

Moreover, since created things contain void, the void must be surrounded by solid matter: nothing can be shown by valid argument to contain void concealed in its substance, unless you concede that what confines the void is solid; and the only thing capable of keeping in confinement the void within objects is an aggregate of matter. Therefore matter, which consists of solid substance, is able to be everlasting, even though all compound bodies suffer dissolution.

There is the further point that, if there were no empty space, the whole universe would consist of solid matter; conversely, if there were no definite bodies to fill the places which they occupy, the whole universe would be space, vacuum, and void. So it is evident that matter and void are interspersed and alternate with one another, since the universe is neither a complete plenum nor a complete vacuum. There are, therefore, definite bodies that have the effect of interspersing empty space with full space. These bodies cannot be shattered by the impact of blows from without, nor can their fabric be penetrated and so unraveled from within, nor can they be demolished by any other kind of assault; this is a point I explained to you a little while ago.[37] For obviously it is

37. **531:** 215–264, 485–502.

impossible for anything containing no void to be crushed or smashed or cut in two, or for it to admit any of the forces fatal to all compound things —moisture, permeating cold, and penetrating fire. And the more void each thing holds within it, the more its internal structure is weakened by the assaults of these forces. So if the ultimate particles are, as I have taught, solid and without void, they must of necessity be everlasting.

Besides, if matter had not been everlasting, before now all things would have returned to nothing, and everything we see must have been reborn from nothing. But since I have shown above[38] that nothing can be created out of nothing or, once born, reduced to nothing, the first elements must consist of imperishable substance, into which everything can be resolved at its last hour, so that a constant supply of matter may be available for the renewal of things. Therefore the primary elements are solid and simple; otherwise they could not have been preserved through the ages and so renewed things from infinite time past.

Again, if nature had appointed no limit beyond which things cannot be broken up, the particles of matter would already have been so pulverized by the destructive hand of past ages that nothing could within a specific length of time be conceived from them and win its way to the prime of life. For it is an observable fact that anything can be destroyed faster than it can be reconstructed; and so what eternity's long duration of days and all time past would already have disarranged and disintegrated could never be repaired in the rest of time. But as it is, it is evident that a definite and permanent limit to the process of destruction has been established, since we observe that each thing is renewed, and that for every kind of being there is established a specific period of time in which it is able to attain the bloom of maturity.

There is the further point that, once it is allowed that void is an ingredient in things, the absolute solidity of the ultimate particles of matter can be reconciled with an explanation of the formation and behavior of all soft substances —air, water, earth, and fire.[39] On the other

38. **543:** 149–264.

39. **567:** The four elements of Empedocles, whose theory is criticized in 716–829. Their perishability is one of Lucr.'s objections in that passage, and it is also one of his arguments for the mortality of the world in 5.235–323. Here he may be thinking not only of Empedocles, but also of Anaxagoras (see 847–856) and those who, like Heraclitus (see 635–704), chose one of the four substances as the primary element.

hand, if the primary elements of things were soft, the origin of hard flintstones and iron would be inexplicable, because nature as a whole would be without any initial foundation. The elements therefore derive their power from their solidity and simplicity, and it is their concentration in denser union that enables all compound bodies to be closely compacted and display stalwart strength.

Moreover, even on the supposition that no limit to the division of matter has been established,[40] it must be admitted that particles corresponding to every kind of thing have survived to this day from time everlasting, hitherto immune to the danger of any attack. But since such particles are by nature fragile, the supposition does not tally with the fact that they have succeeded in surviving from time everlasting in spite of having been battered through the ages by innumerable blows.

The author here gives another argument that matter cannot be infinitely divisible and thus there must be indivisible particles (i.e. atoms).

Then again,[42] since each of those ultimate particles that are beneath the ken of our senses has an extreme point, that point is evidently without parts and is the smallest existence; it never has had and never will be able to have an independent, separate existence, since it is itself a primary and unitary part of something else. Then rank upon rank of similar parts in

40. **577–583:** Lucr.'s main target here is Anaxagoras, for whom matter is infinitely divisible (see 843–844).

41. **595–596:** Identical to 76–77 (see note there), 5.89–90, 6.65–66.

42. **599–634:** The doctrine that each atom, though physically indivisible, has a limited number of inseparable "smallest parts," which are the minima of extension and magnitude, is expounded by Epicurus *Hdt.* 56–59. Lucr. introduces it again at 746–752, where he is criticizing Empedocles and others who think like him, and at 2.478–499, where he is arguing that the number of atomic shapes is not infinite.

close formation provide the ultimate particle with its full complement of substance and, since they cannot have an independent existence, they must cling so fast to the whole atom that they cannot by any means be wrenched apart from it. The primary elements are therefore solid and simple, being formed of smallest parts packed solid in a closely cohering mass; they are not compounded as a result of the assembly of those parts, but rather derive their power from their everlasting simplicity; nature does not allow anything to be torn away or subtracted from them and so preserves the seeds of things.

Moreover, if there is no smallest point, every minutest body will be composed of an infinite number of parts, since a half of a half will always have a half and there will be no limit to the possibility of division. If this is the case, what will distinguish the whole universe from the smallest thing in it? Nothing; for, no matter how fully infinite is the whole universe, the minutest objects will equally be composed of an infinite number of parts. But since sound judgment loudly protests against this conclusion and denies that the mind can believe it, you must admit defeat and acknowledge the existence of points that have no parts and are the smallest things; and this being so, you must also acknowledge the existence of solid and everlasting primary elements.

Lastly, if it had been creative nature's way to compel all things to be resolved into their smallest parts, she would no longer be able to renew anything out of them, because objects that are insufficiently bulky to have any parts cannot possess the essential characteristics of generative matter, namely the variety of interlacements, weights, collisions, concurrences, and movements that cause all things to happen.

The author concludes book I by arguing – SIXTH principle – that the universe must be infinite (yet it is not infinitely divisible)

Now then, since I have demonstrated that indestructible particles of absolutely solid matter fly about incessantly throughout eternity, let us reveal whether there is a limit to their sum or not; let us establish also whether the void whose existence we have discovered, the place and space in which everything happens, is essentially finite, or whether it opens out to boundless breadth and abyssal depth.

In fact, the universe is not bounded in any direction; otherwise it would inevitably have an extremity. Now it is plain that nothing can have an extremity, unless there is something on the farther side to bound it, so that there is seen to be a point beyond which our vision cannot trace the object. And since we must admit that there is nothing outside the aggregate of things, it has no extremity and therefore has no end or limit.[75] It makes no difference in which area of it you take up your position, because, no matter what place anyone may occupy, the infinite extent of the universe in every direction is not diminished.

Then again, just suppose that all the existing space were finite, and that someone ran forward to the edge of its farthest border and launched a spear into flight: do you favor the view that the spear, cast with virile vigor, would fly far and reach its target, or do you suppose that something could check it by obstructing its course? You must grant and adopt one or the other of these hypotheses, and yet both deny you a subterfuge and compel you to acknowledge that the expanse of the universe is infinite. For whether there is something to check the spear and prevent it from hitting its mark and lodging in its target, or whether it flies on, it did not start from the end of the universe. In this way I will dog you: wherever you locate the farthest border, I will ask about the ultimate fate of the spear. Our conclusion will be that nowhere can a boundary be fixed: no escape will ever be found from the limitless possibility of flight.

Moreover, if the whole extent of the entire aggregate of things were hemmed in on all sides and had fixed borders, so that it was finite, the fund of matter, impelled by its solid weight, would have streamed together from all sides to the bottom; nothing could happen beneath the

75. **958–964:** Cf. Epicurus *Hdt.* 41.

pavilion of the sky: indeed there would be no sky at all and no light of the sun, since from time everlasting all matter would have been subsiding into an inert mass. But, in fact, the ultimate particles are assuredly given no respite from movement, because there is no bottom at all where they can congregate and settle. All activity on all sides always takes place in perpetual motion, and the particles of matter are supplied from below, darting out of infinite space.

Lastly, before our eyes one thing is seen to bound another: the air sets a boundary to the hills, and the mountains to the air; the land delimits the sea, and the sea delimits every land; but the universe has nothing beyond to bound it.

Therefore the nature of space and the unfathomable depth of its abyss is such that not even streaks of lightning, gliding through the desert of eternity, could career through it in their course, nor could their progress diminish at all the distance that remains to be traveled. Such is the immensity of the area of space that everywhere lies open to things, infinite in every direction on every side.

Furthermore, nature denies the aggregate of things the power of confining itself within limits, since she compels matter to be bounded by void, and void by matter, so that by their alternation she makes the universe infinite; or else, even if one of the two component parts were not bounded by the other, the extent of its own simple substance would be measureless. [But, if space were finite, it could not contain an infinite amount of matter; and if the aggregate of matter were finite,][76] neither sea nor land nor the lambent precincts of the sky nor the race of mortals nor the sacred bodies of the gods[77] could subsist for one short hour of time. For the fund of matter, wrenched apart from union, would be disaggregated and carried through the vast void; or, to be more precise, it would never have concreted to create anything, since its disconnected elements could not have been united.[78]

Certainly the primary elements did not intentionally and with acute intelligence dispose themselves in their respective positions, nor did they covenant to produce their respective motions;[79] but because throughout the universe 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

76. **1013:** A lacuna must be assumed after 1013. The words in brackets give the likely sense of the missing lines.

77. **1015:** On the Epicurean gods, see pp. xxviii–xxix.

78. **1014–1020:** Cf. Diogenes of Oinoanda *fr.* 67.

79. **1021–1023:** Repeated at 5.419–421.

arrangements such as those that created and compose our world;[80] and
the world, guaranteed preservation through many long years once it had 1030
been directed into harmonious movements, in its turn ensures 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. But they could not possibly do this, unless an abundance
of matter were able to issue from infinite space, so that they constantly
make good all their losses in due season. For just as animals, deprived of
food, naturally lose substance and dwindle away, so all things are bound
to disintegrate as soon as their supply of matter, diverted somehow from 1040
its course, has failed. And external blows on all sides cannot conserve the
whole of any world formed by the combination of atoms. By dint of
repeated hammering, the atoms can keep part of it in check temporarily
until reinforcements arrive to make up the sum. Sometimes, however,
they are forced to rebound and thereby give the primary elements of
things ample space and time to escape, enabling them to break loose
from union. So I insist that multitudinous atoms must rise up [out of
space];[81] in fact, there could not even be a succession of blows, if there 1050
were not infinite resources of matter on all sides.

1060

80. **1024–1028:** Cf. 5.187–194, 422–431.

81. **1049:** I have supplied the words in brackets to make the sense clear.