women receive the burden of pregnancy from some men more readily than from others. Often a woman, having proved infertile in several earlier marriages, has at last found a husband from whom she could conceive babies and be enriched with sweet offspring. Often too a man whose previous wives, in spite of their fertility, had been unable to have babies, has found a partner of compatible makeup who could give him children to be the prop of his old age. All this shows how very important it is that semen should be able to mix with semen in a manner suited to produce conception, thick seed blending with fluid, and fluid with thick. And here diet plays an important part; for some foods thicken the semen in our limbs, while others dilute and weaken it.

Another factor of paramount importance is the position in which the seductive pleasures of sex are enjoyed. The generally accepted view is that wives conceive most readily in the style and manner of four-footed beasts, because in this position, with the breasts below and the loins raised, the semen can occupy the appropriate parts. It should be added that wives have no need to make voluptuous movements: the woman opposes and prevents conception, if in her delight she receives the man's penis with her buttocks while making undulating movements with her body all limp; for she drives the furrow out of the direct path of the plowshare and diverts the seed from the vital parts. Whores regularly make these movements for their own ends, to minimize the risk of conception and pregnancy and at the same time to make sexual intercourse itself more pleasing to men. But obviously our wives have no need of such methods.

It is not due to divine intervention or the arrows of Venus that a woman with little pretension to beauty sometimes comes to be loved. Not infrequently the woman herself, by her behavior, by her obliging ways, and by the scrupulous neatness of her person, easily accustoms a man to spend his life with her. Furthermore, mere habit generates love. For anything that is struck by incessant blows, no matter how lightly, in long lapse of time is overpowered and made to yield. Have you not noticed that even drops of water falling upon a rock in long lapse of time hollow out that rock?

BOOK FIVE

Preface

Eulogy of Epicurus (1–54)
Reference to the argument of the preceding books, and statement of the subject matter of the present book (55–90)

The Nature and Formation of Our World

The world will be destroyed sooner or later (91–109)
The earth and the heavenly bodies are not divine (110–145)
The world is not home to the gods (146–155)
The gods did not create the world for the benefit of human beings (156–234)
The four component elements of the world (earth, water, air, fire) are mortal; therefore the entire world is mortal (235–323)
Two indications that the world is young and had a beginning: history does not go far back, and the arts and sciences are still developing (324–350)
The world does not have the attributes of an immortal thing (351–379)
The present war between the elements may sometime end in victory for one of them, and the world will be destroyed (380–415)
How the different parts of the world were formed (416–508)

Astronomical Phenomena

The movements of the heavenly bodies (509–533)
How the earth remains at rest in the middle of the world (534–563)
The magnitude of the sun, moon, and stars (564–591)
How the sun, despite its small size, is able to radiate so much light and heat (592–613)
The orbits of the heavenly bodies (614–649)
The causes of nightfall and dawn (650–679)
Why the length of day and night varies (680–704)
The phases of the moon (705–750)
The causes of solar and lunar eclipses (751–770)

The Beginnings of Life on Earth

Introduction (772–782)
The creation of vegetable and animal life. The motherhood of the earth (783–836)

The Development of Civilization

Who possesses the powerful inspiration to compose a poem worthy to match the majesty of my theme and these discoveries? Who has the command of language needed to devise praises proportionate to the merits of him who has bequeathed to us such rich treasures, sought and acquired by his own intellect? No one, I think, who is of mortal birth. For if we are to speak as the majesty of his revelations demands, a god he was,

a god,[1] illustrious Memmius, who first discovered that principle of life which is now identified with wisdom, and who by his genius saved life from such mighty waves and such deep darkness and moored it in such calm water and so brilliant a light.[2]

Do but compare with his gifts the divine discoveries of others in ancient times. Ceres, according to legend, introduced corn to mortals, and Liber[3] the liquor made from the juice of the grape; and yet these things are not essential to life: indeed it is reported that some peoples even now live without them. But a good life could not be lived without a pure mind,[4] and so we have the more justification for deifying the author of the sweet consolations of life that, disseminated throughout mighty nations, even now are soothing people's minds.

If you consider that his achievements are surpassed by those of Hercules,[5] you will stray still further from the path of sound judgment. What harm could come to us now from those great gaping jaws of the Nemean lion or from the bristly Arcadian boar? What could the Cretan bull do, or

1. **8:** Although Epicurus was mortal (1.66, 3.1042–1044), he deserves to be called a god or godlike, because he himself achieved tranquillity of mind such as the gods enjoy, and because he enabled others to achieve the same goal. See pp. xii, xix, xxxi.

2. **11–12:** For the image of darkness and light, see also, e.g., 1.146–148 (repeated in three other places), 2.15, 3.1–2. As for the image of storm and calm, it is relevant to note that Epicurus himself uses it in reference to the mind in turmoil and at peace, and that *ataraxia*, the Greek word for the Epicurean moral ideal of "freedom from disturbance," is a metaphor derived from calm water and weather. See M. F. Smith, *Classical Review* 16 (1966) 265–266.

3. **14:** Native Italian god of fertility, especially associated with wine and frequently identified with the Greek Dionysus or Bacchus.

4. **18:** By "a pure mind" Lucr. means a mind free from unnecessary fears and desires and from the ills that result from them. See 43–48, 6.24–25.

5. **22:** Hercules, a sort of patron saint of the Cynics, was adopted as a moral hero by the Stoics as well. Lucr. mentions eight of the twelve Labors: (1) the killing of the Nemean lion (Nemea is near Argos); (2) the capture of the Erymanthian boar (Erymanthus is a mountain in Arcadia); (3) the capture of the Cretan bull; (4) the killing of the Hydra of Lerna (a marsh near Argos); (5) the capture of the cattle of Geryon, a mythical king of Spain with three bodies; (6) the destruction of the dangerous birds that inhabited lake Stymphalus in Arcadia; (7) the capture of the horses of Diomedes, king of the Bistones, a Thracian people who lived near Mt. Ismarus; (8) the plucking of the golden apples from the serpent-guarded tree in the garden of the Hesperides (note the parallelism between this myth and the story of the Garden of Eden).

the scourge of Lerna, the hydra with its palisade of poisonous snakes, or mighty triple-breasted, triple-bodied Geryon? How could our safety be threatened by the [birds] haunting the Stymphalian [lake][6] or Thracian Diomedes' horses breathing fire from their nostrils near the Bistonian plains and Ismarus? As for the guardian of the gold-gleaming apples of the Hesperides, the fierce, cruel-eyed serpent, with its huge body coiled around the tree trunk, what possible harm could it do beside the Atlantic shore and those stern tracts of ocean that none of us visits, and where not even barbarians venture? And all other such monsters that were destroyed—if they had not been vanquished, but were still alive, what harm could they possibly do? None at all, in my judgment; for the earth even now swarms to repletion with wild beasts: the woods and mighty mountains and deep forests all teem with trembling terror; for the most part, however, we have the power to avoid these places. But unless our minds are purified, what strife and what dangers find their way into us against our will! What poignant pangs of passion disturb and distract us, and equally what fears! And pride, impurity, and petulance—what havoc do they not make? What of luxury and laziness? And will not the man who, using words instead of weapons, subdued all these monsters and banished them from the mind rightly be considered worthy of a place among the gods? Especially since it was his wont to present many precepts in a good and godlike manner about the immortal gods themselves and to reveal the whole nature of things in his discourse.

Treading in his footsteps, I have been following his doctrines and explaining in my verses the necessity for each thing to abide by the law that governs its creation, and its impotence to rescind the strong statutes of time. Most important of all, we have discovered that the soul is fashioned and formed of substance that is subject to birth; and we have found that it cannot endure unscathed through vast eternity, but that the mind is deceived by images in sleep when we have a vision of one whom life has deserted.

To proceed, I have now reached the point in my argument where I must demonstrate that the world is composed of substance subject to birth and death. I must also explain how that great confluence of matter established earth, sky, stars, sun, and the globe of the moon; what living things sprang from the earth, and what creatures have never been born;[7] how human beings began to converse with one another, using various sounds to denote various things; and how their minds were infiltrated by

6. **28:** It must be assumed that a line has been lost after 28.

7. **70:** Creatures like Centaurs, Scylla, and Chimaera. See 878–924.

that fear of the gods which all over the earth maintains the sanctity of the shrines, lakes, groves, altars, and images of deities. Furthermore, I will show by what force piloting nature steers the courses of the sun and the motions of the moon, in order to preclude the possibility of our thinking that these bodies freely and spontaneously pursue their perennial courses between heaven and earth out of kindly consideration for the growth of crops and living creatures, or that they roll on by some divine design. For even those who have rightly learned that the gods lead lives free from care may wonder how all things can be carried on, especially the phenomena above their heads in the ethereal regions; and then they relapse into the old superstitions and subject themselves to cruel tyrants whom they believe, poor fools, to be omnipotent, in their ignorance of what can be and what cannot, and again by what law each thing has its scope restricted and its deeply implanted boundary stone.[8]

To proceed, and to delay you no longer with promises, first of all, Memmius, consider the sea, the earth, and the sky: their triple nature, their three bodies, their three different forms, their three huge fabrics, a single day will consign to destruction; and the massive structure of the world, sustained for countless years, will collapse. I am well aware how strange and stupendous to the mind is the notion that heaven and earth are destined to be destroyed, and how difficult it is for me to win belief by words alone. This is always the case when one brings to people's ears something hitherto unfamiliar, without being able to set it before their eyes or place it in their hands—the two highways that give belief easiest access to the human breast and the precincts of the mind. Nevertheless I will speak out. Perhaps the actual event will confirm my words, and you will see the whole world shattered in a brief space of time by violent earthquakes. But may piloting fortune steer this catastrophe far from us, and may reasoning rather than reality convince you that the whole world may give way and collapse with a horrendous crash.

But before I begin to utter oracles on this subject[9]—oracles more holy

8. **82–90:** Repeated at 6.58–66. Lines 89–90 are also identical to 1.76–77 and 595–596.

9. **110–234:** Although this passage is a digression in that it separates the introduction to the argument that the world is mortal (91–109) from the argument itself (235–415), it is fully relevant to the main purpose of Book 5 and indeed to one of the main purposes of the whole work, which is to show that the world is not divinely made and governed, and that the gods are not to be feared. There has been much disagreement about Lucr.'s source(s) and target(s) in the

and much more reliable than those that the Pythia pronounces from the tripod and bay of Phoebus[10]—I will expound to you many consolations in words of wisdom, lest, restrained by superstition's curb, you should suppose that earth and sun and sky, sea, stars, and moon, by virtue of their divine body, must endure eternally, and therefore should think it right that, as with the Giants,[11] punishment appropriate to their monstrous crime should be inflicted on all who by their reasoning destroy the ramparts of the world and seek to extinguish the celestial radiance of the sun, degrading immortal things with mortal speech. The fact is that the phenomena that I have mentioned are so far from being divine, and are so unworthy to be enrolled among the gods, that they may rather be regarded as outstanding examples of the inanimate and insensible.

It cannot be supposed that mind and intelligence can exist in company with any and every kind of body. A tree cannot exist in the sky,[12] or clouds in the salt sea; fish cannot live in fields; blood is not found in timber, or sap in stones. The place where each thing may grow and exist is fixed and determined. Thus the substance of the mind cannot come to birth alone without the body or exist separated from sinews and blood. But even if this were possible, the mind could far more easily reside in the head or the shoulders or the base of the heels, or be born in any other part of the body, and so at least remain within the same person, within the same vessel. However, since even within our own body it is evident that a special place is firmly fixed and reserved for the existence and growth of the spirit and mind, it is all the more necessary for us to deny that they could survive wholly outside the body and the living frame in crumbling clods of earth or in solar fire or in water or in the coasts of high heaven. Such things, then, are not endowed with divinity, since they cannot even be animated with life.

passage. Undoubtedly his main source is, as usual, Epicurus, whose main targets will have been Plato in some places and Aristotle in other places, but (see notes on 1.638, 4.823–857) one should not assume that Lucr.'s targets are always the same as those of his master, even if he is deploying the same arguments. Most of the beliefs attacked in this passage, including the beliefs that the world and the heavenly bodies are divine, and that the world was created by the gods for the benefit of human beings, were held by the Stoics (see, for example, Cicero *DND* 2) and, as my notes on 156–173 and 200–203 show, it is the Stoics whom Diogenes of Oinoanda names as his opponents in passages that present identical arguments to those put forward by Lucr.

10. **111–112:** Repeated from 1.738–739. See note on 1.737–739.

11. **117:** The Giants stormed heaven and were destroyed by thunderbolts.

12. **128–141:** Repeated, with slight alterations, from 3.784–797.

Another notion that you cannot possibly accept is that the holy habitations of the gods are located in any part of the world.[13] In fact, the nature of the gods is so tenuous, and so far removed from our senses, that it is scarcely perceptible even to the mind; and since it eludes the touch and impact of our hands, it cannot touch anything that is tangible to us; for what is itself intangible cannot touch. Therefore the gods' habitations also must be dissimilar to our habitations and as tenuous as their bodies. This I will subsequently prove to you with ample argument.[14]

To assert, moreover, that the gods purposely prepared the world and its wonders for the sake of human beings; that we should therefore praise their admirable handiwork and regard it as eternal and immortal; that it is sinful to use any means at any time to displace what was established by the ancient design of the gods for the perpetual use of the human race, or to assail it by argument and turn it topsy-turvy; to invent these and all other such conceits, Memmius, is preposterous. For what benefit could immortal and blessed beings derive from our gratitude, that they should undertake to do anything for our sake? What new occurrence could induce them, after such ages of tranquillity, to desire to change their former mode of life? Obviously a new state of things is bound to please one who is discontented with the old; but when one has suffered no distress in time past, but has led a life of happiness, what could kindle in one a passion for novelty?[15] Again, how could it have harmed us never to have been created? Are we to believe that our life lay groveling in murk and misery until the first day of creation dawned for us? All people, once born, must certainly wish to remain in life, so long as seductive pleasure detains them; but if one has never tasted the love of life or been numbered among the living, how does it harm one not to have been created?

13. **146–147:** The Epicureans located the homes of the gods in the spaces between the worlds (*intermundia*).

14. **155:** The apparent failure to fulfill this promise is to be attributed to lack of revision. See p. xi.

15. **156–173:** Cf. Diogenes of Oinoanda *NF* 126–127.VI–IX, *fr.* 20. Attacking the Stoics for believing that the gods created the world either for human beings or for their own benefit, and that they take providential care of their creations, he pours scorn on the idea that they wanted the world as their city and human beings as their fellow citizens. Like Lucr., he wants to know what could have induced them to do what they did: "For god [is] . . . a living being who is indestructible [and] blessed from [age to] age, having complete [self-sufficiency]. Moreover, what [god, if] he had existed for infinite [time] and enjoyed tranquillity [for thousands of years, would have got] this idea that he needed a city and fellow citizens?"

Furthermore, how was a model for the creation of things implanted in the gods? How did they obtain the conception of human beings, so that they might know and perceive in their minds what they wished to produce? And how did they ever recognize the capacity of the primary particles and the potential effect of their different arrangements, if nature herself did not furnish them with a pattern for creation?[16] The fact is that from time everlasting countless elements, impelled by blows and by their own weight, have never ceased to move in manifold ways, making all kinds of unions and experimenting with everything they could combine to create.[17] It is not surprising therefore that they have at last fallen into such arrangements, and acquired such movements, as those whereby this aggregate of things is maintained and constantly renewed.

Even if I had no knowledge of the primary elements of things, I would venture to deduce from the actual behavior of the sky, and from many other facts, evidence and proof that the world was by no means created for us by divine agency: it is marked by such serious flaws.[18]

In the first place, of the whole space pavilioned by the sweeping expanse of heaven, mountains and forests, the haunts of wild beasts, have seized a greedy portion, while part is occupied by rocks and waste marshes and the wide sea that separates the coasts of continents.[19] Mortals are deprived of almost two thirds of the remaining land by torrid heat

16. **181–186:** The same argument is used in 1046–1049, where Lucr. is maintaining that language cannot have been an artificial invention. The point is that neither the gods nor the inventors of language can have had a conception of what they wanted to create, if nature had not already created a world or language that they could use as a model. The argument depends on an important principle of Epicurean epistemology, which is that repeated reception of sense impressions creates in the mind a general conception of each class of things, and that without these conceptions, to which further sense impressions are referred, scientific knowledge would be impossible. On (pre)conceptions as a criterion of truth, see p. xxv.

17. **187–191:** Repeated (except the beginning of 187) at 422–426.

18. **195–199:** Repeated, with minor alterations, from 2.177–181.

19. **200–203:** Diogenes of Oinoanda, arguing against the view, which he assigns to the Stoics, that the gods created the world for the sake of human beings, draws attention, as Lucr. does, to its imperfections. He too mentions the sea, but gives more prominence to it than Lucr. does. He says that the sea occupies so much space that "it makes a peninsula of the inhabited world"; he adds that it has many other drawbacks and, "to cap all, has water that is not even drinkable, but briny and bitter, as if it had been purposely made like this by the god to prevent human beings from drinking" (*fr.* 21.I.13–II.10).

and the perpetual fall of frost; and as for the rest, nature would cover it with briars, if her strength were not resisted by the strength of human beings who, in order to gain a livelihood, persistently groan over the stout mattock and furrow the earth with the deep-driven plow. Unless, by turning up the fertile clods with the plowshare and trenching the soil, we rouse seeds from dormancy, plants cannot spontaneously emerge into the limpid air. And even then, just when our heavy labor is being rewarded, and all over the countryside things are bursting into leaf and flower, they are often scorched by the excessive heat of the ethereal sun or destroyed by sudden rainstorms or battered by the blasts of tearing tornadoes.

Furthermore, why does nature nurture and multiply the terrible tribes of wild beasts, so harmful to the human race by land and sea? Why do the seasons of the year bring diseases? Why does premature death prowl about?

Consider too how a baby, like a shipwrecked sailor tossed ashore by the savage 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; and how it fills the place with its woeful wailings—as well it may, seeing that life holds so much sorrow in store for it.[20] On the other hand, the various domestic animals and wild beasts grow up without ever needing rattles or the soothing and broken baby-talk of a fostering nurse; they do not require different clothing according to the season of the year; and they need no weapons or lofty walls for the defense of their property, since for every one of them everything is produced in abundance by the earth herself, and by nature the deft artificer of things.

20. **222–227:** Imitated by Wordsworth in *To —, Upon the Birth of Her First-Born Child* 1–12: "Like a shipwrecked Sailor tost / By rough waves on a perilous coast, / Lies the Babe, in helplessness, / And in tenderest nakedness, / Flung by labouring Nature forth / Upon the mercies of the earth. / Can its eyes beseech? no more / Than the hands are free to implore: / Voice but serves for one brief cry; / Plaint was it? or prophesy / Of sorrow that will surely come? / Omen of man's grievous doom!" Lucr.'s comment on the appropriateness of the newborn baby's crying has been interpreted as pessimistic, but, although it cannot be dismissed as nothing more than a joke (both the crying of newborn babies and the unhappiness of most human beings are facts), account should be taken not only of the polemical nature of the whole passage, but also of an element of playfulness seen also in the remark, which immediately follows the comment about what awaits the baby, that the young of animals do not need rattles or a nurse's prattle to keep them contented. Lucr. was certainly no pessimist, believing as he did that, thanks to Epicurus, we can achieve a happiness comparable to that of the gods.

In the first place,[21] since the substance of earth and the water and the light breezes of air and the fiery heat that manifestly constitute this aggregate of things all consist of a substance subject to birth and death, we must consider the whole world to be of the same nature. It is an observable fact that all objects whose parts and members manifestly consist of substance subject to birth and death are themselves invariably subject to birth and death. Therefore when I witness the wasting and recreation of the massive members and components of the world, I may be sure that the sky and the earth as well had a beginning and will suffer destruction.

In this connection, do not imagine that I have begged the question in assuming that earth and fire are mortal, in affirming that water and air are perishable, and in asserting that the same elements are reborn and grow again. In the first place, part of the earth, when baked by the sun's incessant rays and trampled by the tread of many feet, sometimes gives off smoky clouds of flying dust, which strong winds disperse throughout the air. Again, part of the soil is washed away by the rains, and rivers abrade and erode their banks. Moreover, whatever the earth sustains and strengthens is duly returned to the earth; and since it is undoubtedly a patent fact that the universal parent is also the universal tomb, you may be sure that the earth is diminished and then is recruited and grows again.

Furthermore, there is no need of words to show that the sea, rivers, and springs are constantly being replenished with a perennial flow of water: the vast downrush of streams on every side is proof enough. But the foremost parts of the water are continually being removed, so that on balance there is no superabundance of liquid. The volume of water is diminished partly by the strong winds that sweep the surface of the sea, partly by the ethereal sun's unraveling rays, and partly by distribution in all directions under the ground. The brine is filtered off, while the fluid streams back and all collects at the riverheads, from which it flows overland in a fresh current, following the channel that once was carved for it to roll down in its liquid course.[22]

I turn now to air, whose whole substance undergoes countless changes each passing hour. For all the emanations from objects are constantly flowing into the vast ocean of air; and unless the air in its turn restored particles to objects and replaced the substance that flows away, everything would by now have been resolved and converted into air. Air, then, is continually being generated from objects and returning to them, since

21. **235:** Lucr. abruptly resumes the argument interrupted at 109.

22. **269–272:** Repeated, with two minor alterations, at 6.635–638.

it is certain that all things are in constant flux.

Likewise the free-flowing fount of limpid light, the ethereal sun, ceaselessly inundates the sky with fresh radiance, instantly supplying new light to replace light. For the foremost part of each bright beam perishes on whatever spot it impinges, as you may learn from what follows. The moment that clouds begin to pass beneath the sun and, as it were, interrupt the rays of light, all the lower part of those rays at once disappears, and, wherever the clouds are carried, the earth is cast into shadow. Here you have proof that objects always need new radiance, that the foremost part of each shining shaft perishes, and that it would be impossible for things to be seen in the sunlight if the source of light itself did not furnish a perpetual supply.

Moreover, you may observe that the lights that we use at night on earth—pendant lamps, and torches with flashing flames flickering through thick, rich smoke—hasten in the same manner, with the help of their burning, to supply new light; their tremulous fires press on and on, so that the light is never interrupted and never leaves the spots that it illuminates: with such rapidity is the extinction of the old flame concealed by the swift birth of the new from all the fires. In the same way, then, we must suppose that the sun, moon, and stars owe their radiance to successive generations of light, and that the foremost parts of their beams perpetually perish. Therefore you cannot possibly believe that these celestial bodies have an unviolable vigor.

Again, do you not see even stones being overpowered by time, tall towers tumbling down, and rocks crumbling away? Do you not see the shrines and statues of the gods succumbing to the stress and strain of age, their sanctity being powerless to extend the limits of destiny or defy the laws of nature? Do we not also observe the monuments of the great moldering, while continuing to inquire whether we believe that they grow old?[23] Do we not see flinty rocks ripped from the heights of mountains crashing down, unable to endure the fierce force of even finite time? The truth is that they would not suddenly be wrenched away and fall, if from time everlasting they had successfully withstood all the assault and battery of time and remained unscathed.

Further, consider this expanse that around and above enfolds the entire

23. **312:** The reading of the manuscripts is manifestly corrupt. I have translated Munro's suggestion *quaerere proporro sibi sene senescere credas,* which, though probably not exactly what Lucr. wrote, gives the likely sense of the line. The idea seems to be that even monuments that, as their inscriptions show, are intended to make the memory of the dead eternal, crumble away.

earth in its embrace: if, as some[24] say, it produces all things from its own substance and takes them back again when they perish, it must itself consist of matter subject to birth and death. For whatever sustains and strengthens other things from itself must be diminished, and then must be recruited when it takes them back.

Moreover, if heaven and earth never had a beginning or birth, but have existed from everlasting, why have there not been other poets to sing of other events prior to the Theban war and the tragedy of Troy?[25] Why have so many heroic deeds so often been buried in oblivion, instead of flowering somewhere, implanted in eternal memorials of fame? The true explanation, in my judgment, is that our world is in its youth:[26] it was not created long ago, but is of comparatively recent origin. That is why at the present time some arts are still being refined, still being developed. This age has seen many improvements in shipbuilding; it is not long since musicians first molded melodious tunes; our system of philosophy too is a recent invention, and I myself am found to be the very first with the ability to expound it in the language of my country.[27]

If by chance you believe that all these same things happened before, but that the races of human beings perished in a great conflagration, or that their cities were razed by a mighty convulsion of the world, or that rivers, rapacious after unremitting rains, inundated the earth and submerged towns, there is all the more necessity for you to admit defeat and acknowledge that heaven and earth are destined to be destroyed. For the fact that the world was assailed by such serious disorders and dangers indicates that, if it had been attacked by a fiercer force, it would have collapsed in vast ruins. Indeed the one certain indication of our own

24. **320:** It is not clear who are in Lucr.'s mind. Lines 318–323 are based on lines of Ennius' nephew Pacuvius (220–c.130 B.C.), a tragedian.

25. **326:** A lost epic poem, the *Thebaïs,* described the struggle of Eteocles and Polynices, sons of Oedipus, for the throne of Thebes. "The tragedy of Troy" is the subject of Homer's *Iliad.*

26. **330:** On the face of it, the opinion that the world is still young looks to be inconsistent with the view, expressed elsewhere (826–836, 2.1150–1174), that the earth is already in decline.

27. **335–337:** Certainly Lucr. was the first to expound Epicureanism in Latin verse, but it is usually thought that Gaius Amafinius, who popularized the philosophy in Latin prose and, according to Cicero (*Tusc. Disp.* 4.6–7), achieved considerable success, wrote before him. If the usual view is correct (and it probably is), the justification for Lucr.'s claim may be that he was the first Latin writer to give a systematic account of Epicurean physics.

mortality is our susceptibility to the same maladies that affected those whom nature has removed from life.[28]

Furthermore, all things that subsist eternally must either be composed of solid substance, so that they repel blows and are impenetrable to anything that might destroy the close cohesion of their parts from within—like the elements of matter, whose nature I have already demonstrated; or their ability to survive throughout all time must be due to their immunity from blows—as is the case with void, which is always intangible and never experiences any impact; or else the cause of their indestructibility must be the absence of any surrounding space into which their substance might disperse and dissolve—as is the case with the totality of the universe: for outside the universe there is no space into which its substance can fly apart, and no matter capable of striking it and shattering it with a powerful blow.[29]

But, as I have shown,[30] the world is not formed of solid substance, since there is an admixture of void in things; nor is it like void; nor is there any lack of particles that could fortuitously gather together out of infinite space and overthrow this aggregate of things in a tearing tornado or inflict on it some other kind of dangerous disaster; nor again is there any shortage of unfathomable space into which the ramparts of the world could be dispersed; or else they may be destroyed by the impact of some other force. Therefore the door of death, far from being closed against the sky or the sun or the earth or the deep waters of the ocean, stands wide open and confronts them with vast gaping jaws. And so you must acknowledge that the world had a birth; for, being of mortal substance, it could not from time everlasting up to the present have succeeded in defying the strong assaults of measureless ages.

Again, since the massive members of the world fight so furiously with one another, engaging in an unrighteous war,[31] do you not see that some end may be assigned to their long struggle? It may be that the sun and every kind of fire will gain victory by drinking up all the waters. But in spite of their strenuous efforts to do this, they are not yet achieving their

28. **348–350:** So, we are meant to understand, the disorders that affected the world are indications of its mortality.

29. **351–363:** These lines also occur (with minor variations) at 3.806–818.

30. **364:** 1.329–369.

31. **380–381:** "The massive members of the world" are the four elements—fire, water, air, earth. The war between them is called "unrighteous," because it is a civil war, the elements being members of a single "state."

aim; for the rivers make up the supply of water and moreover threaten to inundate the whole world with a deluge from the unfathomable abyss of ocean. The threat is vain, however, since the winds that sweep the surface of the sea, and the ethereal sun with its unraveling rays, diminish the volume of fluid and are confident of their ability to dry up the whole world before the water can attain its goal. Such is the warlike spirit of these elements, as in equal contest they strive and struggle with one another for the control of a mighty empire. But once, according to legend, fire triumphed, and once water held sway on the plains.

Fire was victorious and went around burning up much of the world, when the strong steeds of the sun went astray and wildly whirled Phaëthon[32] through the whole heaven and over every land. But then the omnipotent father, deeply incensed, with a sudden stroke of his thunderbolt struck the presumptuous Phaëthon from his chariot to the earth; and Phoebus, meeting him as he fell, caught the eternal lamp of the world,[33] retrieved the scattered steeds, reyoked the trembling creatures, and then, guiding them along their proper path, restored everything to order. At least so sang the ancient poets of Greece.[34] But the story is very far removed from the truth. In reality, fire can triumph only when an excessive number of igneous particles have gathered together out of infinite space; and then unless its strength is subdued in turn by some other force and subsides, it destroys and consumes everything with scorching blasts.

Once too, so legend relates, water gathered together and began to triumph, when its waves overwhelmed much of the human race.[35] Then, when the great mass of particles, which had gathered together out of infinite space, was by some means diverted and repelled, the rains stopped and the rivers diminished their violence.

32. **397:** Phaëthon, whose Greek name means "Shiner," was the son of the sun (Phoebus in our passage). He obtained his father's permission to drive the chariot of the sun for a day, but lost control and would have set the earth on fire if Jupiter ("the omnipotent father") had not killed him with a thunderbolt. Ovid tells the story in detail in *Metamorphoses* 1.750–2.400. (Appropriately, in recent years an asteroid that orbits the sun on a wildly eccentric course has been named Phaëthon. In 1988 astronomers calculated that this body will eventually pass very close to the earth, and that a collision around A.D. 2250, though unlikely, is not impossible. So perhaps Jupiter will have to intervene a second time.)

33. **402:** Needless to say, Lucr. does not believe in an eternal sun any more than he believes in Jupiter's omnipotence or indeed in the existence of Phaëthon. He is parodying the language of "the ancient poets of Greece" mentioned at 405.

34. **405:** One poet of whom Lucr. is thinking may be Euripides, of whose tragedy *Phaëthon* fragments survive.

35. **411–412:** An allusion to the flood in the time of Deucalion, the Greek Noah.

I will now explain in order how that great concourse of matter established the earth and the sky and the unfathomable ocean and the sun and the moon and their courses.

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. In reality, from time everlasting countless elements of things, impelled by blows and by their own weight, have never ceased to move in manifold ways, making all kinds of unions and experimenting with everything they could combine to create; and that is why, after wandering far and wide during mighty ages of eternity and experiencing every kind of movement and combination, at last those atoms have met which, when suddenly dashed together, often form the foundations of mighty fabrics—earth, sea, and sky, and the family of living creatures.

At first it was not possible to see the wheel of the sun soaring aloft with free-flowing light, nor the stars of the spacious firmament, nor sea nor sky nor earth nor air nor indeed anything resembling the things we know. There was only a newly formed, turbulent mass of primary elements of every kind; and these were discordantly waging a war that involved constant confusion of interspaces, courses, interlacements, weights, impacts, concurrences, and motions, because, owing to the diversity of their shapes and the variety of their forms, they could not all form lasting unions or intercommunicate appropriate motions. Then the different parts began to separate, and like elements began to unite with like, thus starting the evolution of the world, the distribution of its members, and the disposition of its vast components—that is, the division of the high heaven from the earth, the allocation of a separate place to the sea for its expanse of water, and the isolation of the ethereal fires so that they should be pure and unmixed.

In the first place, all the particles of earth, by reason of their weight and intertanglement, congregated in the middle and occupied the lowest positions; and the more closely they became united and intertangled, the more they squeezed out the elements that were to form the sea, the stars, the sun, the moon, and the ramparts of the mighty world. For the component particles of all these bodies are smoother, rounder, and much smaller than the elements of earth. And so first the fire-laden ether immediately[36] burst out through the interstices of the porous earth and raised itself on high and, being light, carried with it many fires. The process was not dissimilar to one which we often witness, as soon as the

36. **458:** I follow W. S. Watt, *Philologus* 140 (1996) 252, in adopting Bentley's *protinus* for *partibus*.

morning light of the radiant sun begins to glow golden over the dew-pearled grass: the ponds and perennial streams exhale a mist, and the earth itself is sometimes seen to steam; and when all these exhalations rise and mass together high above us, their substance condenses to form a cloudy tissue that veils the sky. Similarly, then, at that time the light and elastic ether condensed to form the vault that overarches the world on every side and, spreading out widely in all directions on all sides, enclosed all other things in a greedy embrace.

The formation of the ether was followed by the birth of the sun and moon, whose spheres revolve in the air midway between the earth and the vast ether: they were not appropriated by either of these elements, because they were neither so heavy as to sink and settle, nor so light that they could glide through the loftiest regions. And yet, despite their intermediate position, they revolve like living bodies and are component parts of the world as a whole. Compare how, with our own bodies, some members may remain still, while others are moving.

After the withdrawal of these elements, the earth suddenly subsided in those parts where the vast, dark-blue expanse of ocean now extends, and flooded the depressions with salt surge. And day by day, the more the surrounding ether's seething tides and the sun's rays compressed the earth by constantly beating on its outer surface from every side, so that it condensed and contracted to its center, the more salt sweat was exuded from its body to swell with its flow the floating plains of the sea, and the more, too, the numerous particles of fire and air slipped out and flew far away to reinforce the lofty, lambent precincts of the sky. The plains subsided, while the mountains grew in height; for the rocks could not sink down, and not all parts of the ground were able to settle to the same level.

Thus, then, the earth, because of the heaviness and compactness of its substance, stood firm, and all the world's sludge (as it were) by virtue of its weight sank down to the bottom and settled there like dregs. Then the sea, then the air, then the fire-laden ether were all left limpid and pure. Each of these elements is lighter than the last, and ether, the most limpid and light of all, floats above the breezy air without mingling its limpidity with the turbulence of the atmosphere: it leaves all the parts below to be tossed by tearing tornadoes, leaves them to be disturbed by capricious squalls, while it bears its own fires along, gliding forward at a steady pace. The ether's ability to flow at an even speed and with uniform effort is indicated by the Pontus,[37] which flows with an unchanging current, constantly preserving the equability of its gliding motion.

37. **507:** The Pontus is the Black Sea. In antiquity it was thought that it constantly flows into the Propontis (Sea of Marmara), toward the Aegean. The same idea is found in Shakespeare's *Othello* 3.3.453–456: ". . . like to the Pontick Sea, / Whose icy current and compulsive course / Ne'er feels retiring ebb, but keeps due on / To the Propontick and the Hellespont."

Let us now consider what causes the motions of the heavenly bodies.[38] In the first place, if the vast sphere of sky rotates, we must assume that its axis is stabilized and enclosed at both ends by the pressure of extramundane air on each pole. Then we must suppose either that another current of air flows above, moving in the same direction in which the sparkling stars of the everlasting[39] firmament revolve, or that another current of air flows below in the opposite direction and drives along the sphere from beneath in the same way that we see streams turning the scoops on a water wheel.

Alternatively it is possible that the sky as a whole remains stationary, while the glittering constellations move onward. A possible explanation for this is that impetuous currents of ether are imprisoned in the sky and, as they whirl around and around in search of an egress, roll with them the fires scattered all over the night-thundering precincts of heaven; or perhaps a current of air from some other outside quarter impels and wheels the fiery stars; or it may be that they can creep forward spontaneously, moving wherever their sustenance attracts and invites them as they feed their flaming bodies all over the celestial field.[40]

Which of these causes operates in our world it is difficult to determine with certainty. I am teaching what can and does happen throughout the universe in the various worlds variously formed; and I am striving to set out several causes that may account for the motions of stars throughout the universe as a whole. One of these causes must impart motion to the heavenly bodies in our world; but to assert dogmatically which of them it is, certainly does not befit one proceeding with cautious steps.[41]

38. **509–770:** On Epicurean astronomy, and on the proper way to investigate astronomical phenomena, see especially Epicurus *Pyth.* and *Hdt.* 78–80. See also p. xxiv. Epicurean astronomy may not be very inspired, but it did inspire Lucr. to write some splendid poetry: see, for example, 731–750.

39. **514:** If the Latin text is correct here, the epithet "everlasting" is very unfortunate, seeing that Lucr. has recently devoted several hundred lines to demonstration that the world, including the sky, is not everlasting. Merrill's tentative suggestion *nocturni* for *aeterni* is tempting: "in which the sparkling stars of the night-sky revolve."

40. **523–525:** The stars are pictured as a flock of grazing sheep moving slowly over a field, as comparison with 2.317–319 confirms.

41. **526–533:** On the doctrine of plurality of causes, cf. 6.703–711 and see pp. xxiv–xxv.

Now, seeing that the earth is able to remain at rest in the middle of the world, it must be assumed that its mass gradually diminishes and disappears, and that it has another substance beneath, which from the beginning of its existence has been conjoined and united with the world's aerial regions in which it is implanted and lives. Consequently the earth is no burden to the air and does not depress it, just as a person's limbs are no burden to their owner: the head is no burden to the neck, and we do not feel that the whole weight of the body is resting on the feet, whereas all weights of external origin that are laid upon us cause us discomfort, though they are often far less heavy than our limbs. So much depends on the properties of each object. The earth, then, far from being an extraneous, alien body suddenly intruded and thrown on an alien air, was conceived simultaneously with the air at the beginning of the world and forms a definite part of the world, just as our limbs manifestly form part of ourselves.

Furthermore, when a violent thunder-stroke suddenly shakes the earth, the earth in its turn shakes all the atmosphere above it; and it could not possibly do this, unless it were closely bound to the aerial and celestial regions of the world. The fact is that earth and air cohere together by common roots[42] and have been conjoined and united from the beginning of their existence. Do you not see too that the soul, despite the extreme subtlety of its substance, is able to sustain the big bulk of our body, because it is so closely conjoined and united with it? And what is the force that can make the body give a nimble leap, if it is not the soul, the helmsman of the limbs? Do you see now how powerful a subtle substance can be when it is conjoined with a heavy substance, as air is conjoined with earth, and the mind with our body?

The wheel of the sun and the heat that it emits cannot be much greater or less than they seem to our senses. For, no matter how distant a fire is, as long as it can project its light on us and breathe a hot blast on our limbs, its size is not diminished at all by the intervening distance: there is no perceptible contraction. Therefore, since the sun's heat and lavish light reach our senses and irradiate the terrestrial regions, it must be assumed that the form and contour of the sun are seen from the earth in their true dimensions with absolutely no enlargement or diminution.[43]

42. **554:** Repeated from 3.325, where the close connection between the body and the soul is emphasized. In 556–563 Lucr. uses that connection to illustrate the connection between the earth and the air.

43. **564–573:** For a sympathetic and interesting discussion of Epicurus' strange conclusion about the size of the sun, see D. Sedley, *Cronache Ercolanesi* 6 (1976) 48–53.

The moon too, whether it illuminates the earth with bastard beams as it moves across the sky, or whether it radiates its own light from its own body, in any case has a magnitude no greater than it appears to have when we perceive it with our eyes. For all objects that we view from a considerable distance through a large tract of air become blurred in appearance before their outline is diminished. Consequently, since the moon displays a distinct form and a clearly defined outline, it must appear to us on earth just as it really is on high—with its true contour and in its true dimensions.

Lastly, what of all the ethereal fires that are visible from the earth? Since, in the case of all our terrestrial fires, the outline seems to vary only occasionally and only a very little one way or the other according to the distance, it is evident that the ethereal fires cannot be more than a minute degree smaller or larger than they appear to be.

It need occasion no surprise that so small a sun can emit so great a light, sufficient to inundate all seas and lands and sky and deluge the whole world with blazing heat. It is possible that this one free-flowing fountain for the whole world has been opened to pour out light in a gushing stream because particles of heat, converging from all parts of the world, congregate and flow together in such a way that they form a single source from which all this heat issues. Have you not noticed how widely a small spring of water sometimes irrigates the meadows and floods the fields?

Another possibility is that, though the sun's fire is not large, its heat affects the air and sets it alight, if there happens to be air ready to hand that is easily ignited by the impact of weak rays of heat. Compare how we sometimes see corn and stubble set ablaze over a wide area by a single spark.

Or perhaps the sun, whose rose-red lamp shines on high, is surrounded by a great deal of invisible fire which, though not distinguished by any radiance, is charged with heat and so greatly strengthens the stroke of the solar rays.

There is no single and simple explanation available of how the sun passes from his summer quarters to the winter tropic of Capricorn and then turns around and returns to his goal, the solstitial point of Cancer, or of how the moon seemingly traverses in a month the course that the sun spends a whole year traveling. As I say, no single cause can be assigned for these phenomena.

Seemingly one of the most plausible possibilities is the revered hy-

pothesis of the great Democritus.[44] According to this, the nearer a heavenly body is to the earth, the less rapidly it is whirled around by the revolution of the sky; for the swiftness and impetuosity of the vortex decreases and diminishes in its lower parts, and so the sun, being much lower in the sky than the blazing signs of the zodiac, gradually falls back among the rearward signs. And the moon falls behind even more: the lower her course, the farther it is from the sky and the nearer to the earth, the less able is she to keep pace with the constellations; and the more languid the vortex that carries her along at a lower level than the sun, the more do all the constellations round about catch up and overtake her. So the reason why the moon apparently returns to each sign more swiftly than the sun is that the signs are returning to her more rapidly than to the sun.

A further possibility[45] is that at fixed times two currents of air blow across the sun's path alternately from opposite regions of the world, and that one is able to push him from the summer constellations right down to the winter tropic with its stiffening frosts, while the other drives him all the way back from the realms of icy darkness to the sultry regions of the blazing signs. Similarly we may suppose that the moon, and the stars that revolve for great years in great orbits, can be propelled by alternating currents of air blowing from opposite directions. Have you not observed that clouds, driven by different winds, move in different directions, the lower contrary to the upper? Why then is it not equally possible for the heavenly bodies to be carried by contrary currents through their vast circuits of the ether?

Night covers the earth with its vast pall of darkness, either because the sun, on reaching the farthest verge of the sky at the end of his long course, in exhaustion breathes out his fires, which have been impaired and weakened by the journey through so much air; or because the same force that carried the solar disk above the earth impels it to change course and pass beneath the earth.

Similarly, the reason why Matuta[46] at a definite hour diffuses the rose-red dawn through the ethereal regions and outspreads her light may be that the selfsame sun, returning from beneath the earth, projects his rays

44. **622:** Repeated from 3.371. See note there.

45. **637–649:** This passage, which is introduced as if it were an alternative to the explanation, offered in 621–636, of varying orbital speeds, actually offers a possible explanation of a different phenomenon, the sun's ecliptic. For full discussion of Lucr.'s confusion, see Bailey's commentary.

46. **656:** Roman goddess of dawn.

into the sky before he appears, striving to set it ablaze. Alternatively it may be that at that particular time particles of fire congregate and numerous seeds of heat regularly stream together, thus causing new sunlight to be created every day. Compare the story of how from the mountain heights of Ida[47] at daybreak one sees scattered fires, which then gather together into a single globe and form a complete disk.

In this connection, it should not be considered strange that these seeds of fire can stream together at so fixed a time to renew the radiance of the sun, seeing that in all departments of nature we observe numerous phenomena occurring at fixed times. Trees blossom at a fixed time, and at a fixed time shed their blooms. At times no less surely fixed, age commands teeth to be shed and a youth to clothe himself in soft pubescent down and have a silky beard flowing down from either cheek. Again, lightning, snow, rains, clouds, and winds occur at more or less fixed seasons of the year. For since causes have operated thus from the beginning, and things have happened in this way from the birthday of the world, they still continue to recur in a fixed order and sequence.

The reason why days wax as nights wane, and daylight diminishes as the nights increase, may be that the selfsame sun, as he runs his course below and above the earth, describes unequal curves in the ethereal regions, dividing his daily circuit into uneven parts; and what he subtracts from one part he adds, as he revolves, to the opposite part, until he reaches the celestial sign[48] where the node of the year[49] makes the nocturnal darkness equal in length to the light of the day. For when the sun has been blown halfway by the north wind or by the south wind,[50] the point that he occupies in the sky is equidistant from the tropics. This is due to the position of the entire zodiacal zone, through which the slow-moving sun takes a whole year to pass, irradiating earth and sky with slanting light, as is clearly shown by the charts of those who have mapped out all the celestial regions and marked the array of constellations with which they are adorned.

Alternatively it may be that the air is denser in certain parts, with the result that the quivering brilliance of the solar fire is retarded beneath the

47. **663:** Mount Ida in Phrygia. The phenomenon to which Lucr. refers is described or alluded to by several other ancient writers.

48. **687:** Aries at the vernal equinox, Libra at the autumnal.

49. **687–688:** The "node of the year" is one of the two points at which the ecliptic and equator intersect (at the equinoxes).

50. **689:** That is, at the vernal or autumnal equinox. For the theory that winds, blowing across the sun's path, push it alternately north and south, see 637–645.

earth and cannot easily penetrate the air and emerge above the horizon. This would explain why in winter nights drag on for a long time, before the dazzling diadem of day appears.

A further possibility is that particles of fire, whose confluence causes the sun to rise at a particular point, regularly stream together more slowly or more swiftly at alternate seasons of the year. Therefore it is evident that those persons speak the truth . . . .[51]

As for the moon, it may be that she owes her brilliance to the impingement of solar rays,[52] and that day by day, as she recedes farther from the sun's disk, she turns her light more fully toward our view, until, when exactly opposite him, she shines with her fullest splendor and, as she soars high above the horizon, sees his setting. Then she must hide her light little by little behind her, as she glides nearer to the sun's fire, moving through the zone of the zodiac from the opposite side. This is the view of those who suppose the moon to be a spherical body, whose course is lower than that of the sun.

It is also possible that as she revolves she may shine with her own light and present various phases of brightness. For she may be accompanied by another body, which glides along with her, continually occulting and obstructing her, but which is invisible because it moves devoid of light; or she may possibly rotate like a ball, one half of whose surface is tinged with gleaming light, and by rotating her sphere present her various phases, until she turns to our wakeful eyes the half that is illuminated before gradually twisting back and withdrawing the luminous part of her sphere. This is the theory that the Babylonian teaching of the Chaldaeans[53] attempts to prove in opposition to the hypothesis of the Greek astronomers—as though the view championed by either party might not be correct, or as though there were any reason why you should venture to embrace the one opinion less than the other.

Lastly, it is difficult to give any convincing reason why a new moon should not be created every day, with a fixed succession of phases and forms, each new-created moon being extinguished each day and replaced

51. **704:** A lacuna must be assumed here. The sense of the missing line or lines is disputed.

52. **705:** The discovery that the moon's light is derived from the sun was probably made by Anaxagoras (on whom see note on 1.830).

53. **727:** Lucr. must be referring especially to the theory of Berosus, who belongs to the late fourth and early third centuries B.C.

by another: one sees many things created in so[54] fixed an order. Spring[55] comes and Venus, preceded by Venus' winged harbinger,[56] and mother Flora,[57] following hard on the heels of Zephyr, prepares the way for them, strewing all their path with a profusion of exquisite hues and scents. Next in the procession comes the parching heat of summer, accompanied by dusty Ceres and blasts of etesian[58] winds. Then autumn advances, and with her walks Bacchus acclaimed with cries of joy. Then follow other seasons and other winds—Volturnus thundering on high and Auster[59] mighty with lightning. At length the solstice brings snow, and winter returns with numbing frost, followed by cold with teeth chattering.[60] Seeing that many things can occur at so fixed a time, it is not surprising if the moon is created at a fixed time and again at a fixed time is destroyed.

In the same way you must suppose that eclipses of the sun and occultations of the moon may be produced by several causes. For why should it be thought that the moon alone is able to cut off the earth from the sunlight and high in the sky interpose her head between the earth and the sun, obstructing his blazing rays with her opaque disk? Why should it not be considered equally possible that some other body, gliding along ever devoid of light, produces the same effect? And again why should not the sun at fixed times grow languid and lose his fires, and then renew his radiance when he has passed through tracts of air so hostile to his flames that his fires are temporarily extinguished and destroyed? And why should the earth alone be able, in her turn, to deprive the moon of light and, as she passes above the sun, herself keep him suppressed while the

54. **736:** Both here and in 750 *tam* is often taken with *multa* rather than with *certo*. However, the word order is against this, and so is 667 where *tam* certainly belongs with *certo*.

55. **737–740:** These lines may have indirectly (through Politian) influenced Botticelli's *Allegory of Spring,* but Lucr. was certainly not the painter's only source of inspiration (see my note in the Loeb).

56. **737–738:** Cupid.

57. **739:** Italian goddess of flowers.

58. **742:** The Greek *etēsios* means "annual," and the epithet was applied to northwesterly winds blowing in the Mediterranean for about forty days annually in the summer. These winds are mentioned again at 6.716, 730.

59. **745:** Volturnus and Auster: east-southeast wind and south wind respectively.

60. **747:** Imitated by Spenser in *The Faerie Queene* 7.7.31.1–2: "Lastly, came Winter cloathed all in frize, / Chattering his teeth for cold that did him chill."

moon in her monthly course glides through the clear-cut cone-shaped shadow? Why should it not be equally possible that some other body passes beneath the moon or glides over the sun's disk so as to interrupt the free flow of radiant light? Furthermore, if the moon shines with a splendor of her own, why should she not grow languid in a certain part of the world while she is passing through regions unfriendly to her own beams?

I have shown how each phenomenon can occur in the azure expanse of the vast firmament, in order that we might understand what force causes the varied courses of the sun and the motions of the moon, and how it is possible for them to suffer eclipse through the interception of their light and shroud the unexpecting earth in shadow, as though they blinked and then with reopened eyes again surveyed all places resplendent with radiant light. And now that I have explained these phenomena, I return to the time when the world was young and the fields were soft, to show what in her first fecundity the earth resolved to raise into the shores of light and entrust to the capricious winds.

First of all the earth produced the various sorts of grasses and invested the hills and all the plains with lustrous verdure, so that the flowery meadows gleamed with green; and then the different kinds of trees were started on a great race of unbridled growth through the air. As feathers, hair, and bristles are the first growths on the limbs of four-footed creatures and the bodies of birds strong of wing, so at that time the newborn earth threw up grasses and saplings first, and then created animals—many species variously produced in many ways.

Certainly living creatures cannot have dropped from heaven,[61] nor can terrestrial animals have emerged from the briny gulfs of the sea.[62] So it follows that the earth has deservedly gained the name of mother, since from the earth all things have been created. Indeed even now multitudes of living creatures spring from the earth under the influence of rains and the heat of the sun.[63] So it is not surprising if at that time more and larger animals were produced, since they grew up when earth and air were young. First of all the various kinds of winged birds were hatched out of their eggs in the springtime, just as now in the summer cicadas spontaneously leave their smooth chrysalises in search of a living and life. The earth, you see, first produced animals at that time because there was

61. **793:** Cf. 2.1153–1154 and see note there.

62. **794:** Cf. 2.1155 and see note there.

63. **797–798:** See note on 2.871–872.

a great abundance of warmth and moisture in the ground. So, wherever a suitable spot offered, wombs grew up, adhering to the earth by roots; and when at the time of maturing these had been burst open by the young ones in their eagerness to escape from the moisture and obtain air, then nature directed to them the ducts of the earth and made her exude from her opened veins a milklike juice, just as now every woman after childbirth is filled with sweet milk because the entire urgent flow of nutriment is directed into her breasts. The earth provided her children with food, the warmth served as clothing, and the grass formed a couch thickly spread with soft down. Moreover, the youth of the world did not produce severe cold or excessive heat or winds of great violence; for all things grow and gain strength together.[64] So I insist that the earth has deservedly gained and deservedly retains the name of mother, since she herself created the human race, and almost at a fixed time[65] produced every species of animal that ranges wildly and widely over the mighty mountains, as well as the various birds of the air.

But because there must be some limit to her fecundity, she stopped bearing, like a woman worn out by lapse of years. For time transforms the nature of the entire world, and everything inevitably passes on from one stage to another. Nothing remains constant: everything is in flux; everything is altered by nature and compelled to change. As one thing decays and declines and droops with age, another arises and emerges from obscurity. In this way, then, time alters the nature of the entire world, and the earth passes on from one stage to another, so that what she once bore she can bear no longer, while she can bear what she did not bear before.[66]

And at that time the earth experimented with the creation of many prodigious things, which were born with bodies of grotesque appearance. There were androgynes—beings halfway between the two sexes, belonging to neither, differing from both; there were some creatures devoid of feet or deprived of hands; there were others dumb for want of a mouth, or blind for want of eyes, or fettered by the adhesion of all the limbs of the body so that they were powerless to do anything or move anywhere or avoid danger or take what they needed. Other equally monstrous and

64. **818–820:** Even climatic phenomena were weak because, like everything else, they were young.

65. **823:** "Almost at a fixed time," i.e., after an almost fixed period of gestation.

66. **836:** D. A. West, *Classical Quarterly* 14 (1964) 102, may be right in taking the meaning to be "so that what bore cannot (namely Earth), and what could not bear can (namely the parents of each species)."

prodigious beings were produced by the earth. But they were created in vain, since nature denied them growth and they were unable to attain the coveted bloom of maturity or find food or be united in the acts of Venus. For we see that the ability of creatures to propagate and perpetuate their species is contingent upon the conjunction of many circumstances: first there must be a supply of food; then there must be a channel by which the generative seeds throughout the body may issue from the slackened limbs; and for the female to be united with the male, both must have organs for the interchange of mutual delights.

At that time, too, many species of animals must have perished and failed to propagate and perpetuate their race. For every species that you see breathing the breath of life has been protected and preserved from the beginning of its existence either by cunning or by courage or by speed. There are also many that survive because their utility has commended them to our care and committed them to our guardianship. In the first place, the fierce breed of savage lions owes its preservation to its courage, the fox to its cunning, and the deer to its speed in flight. On the other hand, the light-slumbering and loyal-hearted dog and every kind of beast of burden, as well as the fleecy flocks and horned herds, are all committed, Memmius, to the guardianship of human beings. They were glad to escape from the wild beasts and seek peace and the plentiful provisions, procured by no exertion of theirs, which we give them as a reward for their utility. But those animals that nature endowed with none of these qualities, so that they were unable either to be self-supporting or to render us any useful service, in return for which we might allow their kind to have sustenance and security under our protection, were of course an easy prey and prize for others, shackled as they all were by the bonds of their own destiny, until nature brought their species to extinction.

But Centaurs never existed,[67] and at no time can there be creatures with a dual nature and double body, so composed of heterogeneous limbs that the powers derived from the two parts can be sufficiently harmonious.[68] The proofs that follow will enable the dullest wit to understand that this is so. In the first place, when three full years have passed round, a horse is in its prime, whereas a boy is by no means so; for often at this age he will still seek in his sleep the milky nipples of his mother's

67. **878:** On the impossibility of such creatures existing, see also 2.700–709. See also 4.732–748, where it is explained how it is that the mind receives images of them.

68. **881:** The text and exact sense are uncertain.

breasts. Later, when the steed's sturdy strength is failing in old age and its limbs are growing languid as life recedes, then and only then the boy's youthful prime is beginning and is clothing his cheeks with silk-soft down. So you cannot possibly believe that Centaurs, compounded of human being and burden-bearing horse, can exist, or Scyllas[69] with half-fish bodies and girdles of ravening dogs, or any other such monsters whose limbs are manifestly incongruous. The parts of such creatures do not simultaneously attain their prime or gain physical strength or decline in old age; they are not enflamed with the same sexual desires; they do not agree in their habits; and they do not find the same foods agreeable: thus one may often see flocks of bearded goats growing fat on hemlock, which is rank poison to human beings. Moreover, seeing that flame will scorch and burn the tawny bodies of lions just as much as any other kind of flesh and blood that exists on earth, how could there be a Chimaera, a single monster compounded of three bodies—lion in front, dragon behind, and she-goat in the middle—belching out fierce flame from its body?[70]

Those who imagine that such animals could have been produced when the earth was young and the sky newly formed, basing their belief only on this empty word "young," may as well babble countless other such absurdities: they may as well say that in that age rivers of gold flowed all over the earth, and that trees regularly bore jewels instead of blooms, or that a man was born with limbs of such prodigious size and strength that he could stride over the deep seas and with his hands make the whole heaven revolve around him.[71] The fact is that, although there were manifold seeds of things in the ground at the time when the earth first produced animal life, this is no proof that beasts of mixed breed, combining limbs of different animals, could have been created. For the things that even now shoot in profusion from the earth—the various kinds of grasses and crops and exuberant trees—cannot, despite their abundance, be created intermixed: each proceeds in its own manner, and all preserve their distinguishing characteristics in conformity with an immutable law of nature.

The human beings who lived on earth in those early days[72] were far tougher than we are, as one would expect, seeing that they were children

69. **893:** See note on 4.732.

70. **904–906:** Cf. 2.705. The description of the Chimaera in 905–906 closely follows that in Homer *Iliad* 6.181–182.

71. **913–915:** Presumably Lucr. is thinking chiefly of the Titan Atlas, who supported the sky.

72. **925–1010:** This justly famous account of the life of primitive human beings

of the tough earth:[73] larger and more solid bones formed the inner framework of their bodies, while their flesh was knit with strong sinews,
930 and they were not easily affected by heat or cold or unaccustomed food or any physical malady. During many lusters of the sun revolving through the sky they lived random-roving lives like wild beasts. No sturdy farmer guided the curved plow; no one knew how to work the fields with iron implements or plant young saplings in the earth or cut the old boughs from tall trees with pruning hooks. What the sun and rains had given them, what the earth had spontaneously produced, were gifts rich enough to content their hearts. For the most part they nourished their
940 bodies among the acorn-bearing oaks; and arbute berries, which you now see turning crimson as they ripen in winter, were then produced by the earth in great abundance and of a larger size. And many other foods were then produced by the world in her youthful prime—coarse foods, but amply sufficient for miserable mortals.

Streams and springs called them to allay their thirst, just as nowadays torrents of water cascading down from mighty mountains with sonorous sound summon far and wide the thirsty troops of wild beasts. Moreover, they occupied sylvan sanctuaries of the nymphs, familiar to them in their
950 wanderings, from which they knew that sliding streams of water slipped to lave with lavish flow the rocks, the wet, wet rocks all green with moss and dripping with moisture; they knew too of places where welling springs gushed out over the open plain.

As yet they had no knowledge of how to utilize fire or clothe their bodies in skins stripped from wild beasts. They lived in woods and mountain caves and forests and, when compelled to escape from the lashing of wind and rain, sheltered their shaggy limbs among the thickets.

They were unable to look to the common interest, and had no knowl-
960 edge of the mutual benefits of any customs or laws. Individuals in-

is no doubt based chiefly on an account that Epicurus gave in *On Nature*. Epicurus' account, which does not survive, will have been heavily indebted to the speculations of the sophists and Democritus. Although Lucr. does not believe that primitive humans lived in a Golden Age (he is well aware of the dangers they faced, especially from wild animals), he considers their simple way of life to have been in many ways more wholesome and happy than the life of "civilized" humans, whose moral progress has not kept pace with their progress in other fields.

73. **926:** The first human beings were literally earth's children: see 805–815 and Diogenes of Oinoanda *fr.* 11 and *fr.* 12.III.2–3. In 962–965 Lucr. refers to primitive men and women having sexual intercourse but does not say whether they had it at the stage when the earth was producing human offspring.

stinctively seized whatever prize fortune had offered to them, trained as they were to live and use their strength for themselves alone.

Venus united the bodies of lovers in the woods. The woman either yielded from mutual desire, or was mastered by the man's impetuous might and inordinate lust, or sold her favors for acorns or arbute berries or choice pears.[74]

And trusting in the extraordinary strength of their hands and feet, they pursued the wild beasts of the forests with sling-stones and ponderous clubs. Many of them they overcame; a few they avoided in hiding places.

When overtaken by night, they laid their shaggy limbs naked on the 970
ground like bristly boars and blanketed themselves with leaves and branches. They did not roam panic-stricken through the countryside in the shadows of the night, seeking the day and the sunlight with loud lamentations, but waited silent and buried in sleep for the sun's rose-red torch to spread its radiance over the heavens. Having always been accustomed from their infancy to see darkness and light born alternately, they could not possibly have ever wondered at the departure of day, or feared 980
that the sunlight might withdraw forever, leaving the earth in the possession of perpetual night. A much greater cause of concern was the way in which the tribes of wild beasts often made rest perilous and wretched for them. Driven from their homes by the arrival of a foaming boar or powerful lion, they would flee panic-stricken from their rocky shelters and at dead of night surrender their leaf-strewn beds to their ruthless guests.

Mortal beings did not leave with lamentations the sweet light of life in greater numbers then than now. Then it more often happened that indi- 990
viduals were caught by wild beasts and provided them with living food for their teeth to tear, and filled the woods and mountains and forests with their shrieks as they saw their living flesh being buried in a living tomb.[75] Others, who had escaped with their bodies part devoured, afterward pressed the palms of their quivering hands over hideous sores and called on Orcus[76] with dreadful cries until they were robbed of life by agonizing pains, destitute of help and ignorant of what treatment their wounds wanted. But never in those times did a single day consign to

74. **965:** Notice "*choice* pears." As W. E. Leonard and S. B. Smith well remark, "even the wild woodland wench had some discrimination and her wooer some technique."

75. **993:** The idea that the devouring beast is its victim's tomb has a long history. In my Loeb note I list sixteen authors, from Aeschylus to Alexander Pope, in whom it is found.

76. **996:** Death.

destruction many thousands of men marching beneath military standards; never did the boisterous billows of the ocean dash ships and sailors upon the rocks. Then, although the waves often rose and raged, they did so idly, vainly, and ineffectually, and lightly laid aside their empty threats. The seductive serenity of the sea was unable to ensnare anyone with the treacherous laughter of its waves: the presumptuous art of navigation was as yet undiscovered.[77] Moreover, whereas in those times it was lack of food that consigned people's languid limbs to death, nowadays it is surfeit to which they succumb; and whereas in those times they often served poison to themselves unwittingly, nowadays they make away with themselves more expertly.

Next they provided themselves with huts and skins and fire,[78] and woman, united to man, went to live in one [place with him. The advantages (?) of cohabitation][79] were learned, and they saw the birth of their own offspring. It was then that human beings first began to lose their toughness: the use of fire rendered their shivering bodies less able to endure the cold beneath the pavilion of the sky; Venus sapped their strength; and the children with their charming ways easily broke down the stern disposition of their parents. It was then, too, that neighbors, in their eagerness neither to harm nor be harmed, began to form mutual pacts of friendship,[80] and claimed protection for their children and womenfolk, indicating by means of inarticulate cries and gestures that everyone ought to have compassion on the weak. Although it was not possible for concord to be achieved universally, the great majority kept their compacts loyally. Otherwise the human race would have been entirely extinguished at that early stage and could not have propagated and preserved itself to the present day.

As for the various sounds of speech, it was nature that prompted human beings to utter them, and it was utility that coined the names of things.[81] The process was not greatly dissimilar to that when infants, in

77. **1002–1006:** Cf. 2.552–559 and see note there.

78. **1011:** On the discovery of fire, see 1091–1104.

79. **1012:** A line is lost after this line.

80. **1019–1020:** On Epicurus' conception of justice as a social contract, see *PD* 31–38. In *PD* 33 he says, "Justice was never an independent entity, but in the relations of people with one another at any place and at any time it is a kind of agreement not to harm or to be harmed." On the Epicurean theory of justice, see also note on 1144.

81. **1028–1090:** On the Epicurean theory of language, of which this passage is the longest statement to survive, see also Epicurus *Hdt.* 75–76 and Diogenes of Oinoanda *fr.* 12.II.11–V.14. The view that language was artificially invented and imposed by an individual, divine or human, is emphatically rejected. Rather it is held to have had a natural origin in the instinctive use which primitive human beings made of their vocal organs in reaction to different sensations and emotions. Later, when the practical convenience of using the same sounds to express the same things was understood, a gradual process of inventing words was started. This theory is typical of Epicurean views on advances in civilization: it is always a case, as Lucr. keeps emphasizing in his account, of nature showing the way and of developments taking place gradually by a process of trial and error.

consequence of their inability to speak, are seen to have recourse to gesture, and point with the finger at objects around them. The fact is that every creature is instinctively conscious of the purpose for which it can use its peculiar powers: a calf, when enraged, will butt and thrust aggressively with its forehead, even before its sprouting horns appear; cubs of leopards and lions will fight with claws and paws and snapping jaws, even when their teeth and claws are scarcely formed; and as for birds of every species, we see them, when first fledged, trusting to their wings and seeking fluttering support from their pinions.

Therefore the hypothesis that in those early times someone assigned names to things, and that people learned their first words from him, is preposterous. Why should it be supposed that this man had the ability to designate everything by a name and to utter the various sounds of speech, while others could not do it? Moreover, if others had not also used words among themselves, how was the conception of their utility implanted in him, and how did he obtain the original power to know and perceive in his mind what he wished to produce?[82] Again, it would have been impossible for one individual to assemble[83] many people and exercise mastery and control over them, so that they would consent to learn the

82. **1046–1049:** Cf. 181–186 and see note there.

83. **1050:** I follow A. Verlinsky, *Hyperboreus* 4 (1998) 302–339, in taking *cogere* to mean "assemble" rather than "compel." As he points out, this interpretation is strongly supported by the parallel passage of Diogenes of Oinoanda: "It is the height of absurdity, as well as quite impossible, that any one individual should have assembled such vast multitudes (at that time there were as yet no kings, and indeed . . . no writing; and with regard to these multitudes, it would have been quite impossible, except by means of a decree, for their assembly to have taken place) and, having assembled them, should have taken hold of a rod and proceeded to teach them like an elementary schoolmaster, touching each object and saying 'let this be called "stone," this "wood," this "human being" or "ox" or "ass" . . . '" (*fr.* 12.IV.3–V.14).

names of things; and it is by no means easy to tell and teach the deaf what needs to be done: the truth is that they would not tolerate it or under any circumstances endure for long to have their ears dinned to no purpose by unintelligible vocal sounds.

Lastly, why is it so very remarkable that human beings, with their power of voice and tongue, should designate things by different sounds according to their different feelings? Even domestic animals and the species of wild beasts, despite their dumbness, regularly utter distinct and different sounds according to whether they are afraid or in pain or full of joy—a fact that may be proved by familiar examples.

When Molossian mastiffs,[84] roused to anger, start to snarl and fiercely draw back their great pendulous lips to bare their cruel teeth, the menacing noise they make is very different from that when they bark and fill the whole neighborhood with their clamor. And when they begin to lick their pups tenderly with their tongue, or when they cuff them with their paws and, snapping at them with checked teeth, pretend gently to swallow them, the whining they make as they fondle them is a very different sound from the howls they give when left alone to guard the house, or the whimpering they make as they slink away from a beating with cringing body. Again, it is surely evident that the neighing of a stallion in his youthful prime when, goaded by the spurs of winged love, he rampages among the mares and from dilated nostrils snorts for the fray,[85] is a different sound from his whinnying when on some other occasion his limbs are shaking with fear. Lastly, consider the various kinds of winged birds—hawks and lammergeyers, and the gulls that seek a living and life in the waves of the briny sea: the cries they utter when they are fighting for food and their prey is offering resistance are very different from their usual cries. And there are some birds that change their raucous notes with the weather: thus the ancient crows[86] and gregarious rooks are said to change their notes according to whether they are calling for water and rain or summoning winds and breezes.

So if animals, despite their dumbness, are impelled to utter various sounds expressive of various feelings, how much more natural is it that mortals in those early times should have been able to designate different things by different sounds!

84. **1063:** These dogs, highly prized as watchdogs and for hunting, were so called because they were bred by the Molossi, a people of Epirus (northwest Greece).

85. **1076:** By "the fray" Lucr. means the sexual encounter with the mare.

86. **1084:** Crows were proverbially long-lived.

At this point, to preclude the possibility of your putting the question to yourself, let me tell you that it was lightning that brought the first fire down to earth for the use of mortals, and that this is the ultimate source of all fiery flames. For we often see things set ablaze by the implantation of celestial flames when a stroke from the sky has charged them with its heat. However, we also observe that when a branchy tree, buffeted by blasts of wind, sways and tosses to and fro, so that it presses against the branches of another tree, the strong stress of friction forces out fire and sometimes makes a fervid flash of flame flare forth, as boughs and trunks are rubbed together.[87] So either of these happenings may have given fire to mortals. Afterward it was the sun that taught them to cook their food and soften it with the heat of flame, since they saw many things mellowing throughout the countryside, subdued by the strokes of its fiery rays.

And more and more every day those endowed with exceptional talents and mental power showed the others how to exchange their former way of life for new practices and, in particular, for the use of fire. Kings began to build cities, and to choose sites for citadels to be strongholds and places of refuge for themselves; and they distributed gifts of flocks and fields to individuals according to their beauty, strength, and intellect; for beauty was highly esteemed, and strength was held in honor. Later wealth was invented and gold discovered, and this easily robbed the strong and handsome of their prestige; for as a general rule, no matter how much physical strength and beauty people possess, they follow in the train of the rich.

And yet if human beings would guide their lives by true principles, great wealth consists in living on a little with a contented mind; for of a little there is never a lack.[88] But people wanted to win fame and power for themselves, in order that their fortune might be based on a firm foundation and their wealth might enable them to lead a peaceful life. But all in vain; for as they strove to climb to the summit of success, they made their path perilous. And even when they reach the summit, envy, like lightning, sometimes strikes them and hurls them down into a hideous hell of ignominy; for envy, like lightning, usually blasts the highest places and all that are elevated above others. So it is far better to live peacefully as a subject than to desire the dominion of states and the

87. **1094–1100:** Cf. 1.897–903.

88. **1117–1119:** Cf. Epicurus *VS* 25: "Poverty, when measured by the natural end of life, is great wealth, and unlimited wealth is great poverty." See also Us. *fr.* 135 quoted on p. xxxi.

control of kingdoms.[89] Let them, then, sweat out their blood and weary themselves in vain, struggling along the narrow[90] path of ambition, since their wisdom is derived from the mouths of others and their aims are determined by hearsay rather than by their own sensations; and such folly does not succeed today and will not succeed tomorrow any more than it succeeded yesterday.

So the kings were slain, the time-honored majesty of thrones and proud scepters tumbled down in the dust, and the glorious crown that adorned the sovereign head, now blood-bespattered beneath the feet of
1140 the rabble, mourned the loss of its high prerogative; for people eagerly trample on what once they intensely feared. Thus the situation sank to the lowest dregs of anarchy, with all seeking sovereignty and supremacy for themselves. At length some of them taught the others to create magistracies and established laws, to induce them to obey ordinances. The human race, utterly weary as it was of leading a life of violence and worn out with feuds, was the more ready to submit voluntarily to the restraint of ordinances and stringent laws.[91] The reason why people were sick and tired of a life of violence was that each individual was prompted by anger to exact vengeance more cruelly than is now allowed by equitable laws.
1151 Ever since that time fear of punishment has poisoned the blessings of life. Violence and injustice enmesh all who practice them: they generally recoil on the wrong doers, and it is not easy for those who by their actions violate the mutual pacts of peace to pass a placid and peaceful life; for even if their crime goes undetected in heaven and on earth,[92] they are bound to fear that it will not remain hidden for ever. And indeed many people, so it is said, by talking in their sleep or in the delirium of disease,
1160 have betrayed their own guilt and disclosed deeply hidden matters and their misdeeds.

89. **1129–1130:** Epicurus advised his followers to "live unnoticed" (Us. *fr.* 551).

90. **1132:** The path of ambition is described as "narrow" because there is not room for many to negotiate it at once.

91. **1144:** It is to be noted that, in the Epicurean view, justice—true justice—is independent of the law. Laws exist not to prevent the wise from doing wrong, but only to protect them from being wronged (Epicurus Us. *fr.* 530), and in an ideal society there would be no need of laws. See J. M. Armstrong, *Phronesis* 42 (1997) 324–334. See also my presentation, in *Anatolian Studies* 48 (1998) 131–143, of an important new passage of Diogenes of Oinoanda (*NF* 126–127.V).

92. **1156:** The expression translated "in heaven and on earth" is a conventional one and is not to be taken as inconsistent with the Epicurean belief that the gods do not interest themselves in human affairs. All Lucr. means is "even if their crime goes completely undetected."

Now what cause has made belief in the gods universal throughout mighty nations and filled cities with altars and prompted the institution of solemn religious rites—rites that now flourish in great states and places? What is it that even now implants in mortals this shuddering fear that all over the earth raises new shrines to the gods and crowds them with congregations on festal days? The explanation is quite easy to supply.[93]

The truth is that even in remote antiquity the minds of mortals were 1170
visited in waking life, and still more in sleep, by visions of divine figures of matchless beauty and stupendous stature. To these beings they attributed sensation, because they saw them move their limbs and speak in a majestic manner appropriate to their splendid appearance and ample strength. They gave them immortal life, because their images presented themselves in constant succession and their forms remained unchanged, but above all because they thought that beings endowed with such mighty strength could not easily be overcome by any force. And they regarded them as consummately happy, because fear of death did not 1180
trouble any of them and also because in sleep they saw them perform many marvelous feats without experiencing any fatigue.

Furthermore,[94] they observed the orderly movements of the heavenly bodies and the regular return of the seasons of the year without being able to account for these phenomena. Therefore they took refuge in ascribing everything to the gods and in supposing that everything happens in obedience to their will. And they located the habitations and sacred quarters of the gods in the sky, because it is through the sky that night and the revolving moon are seen to pass, yes the moon, day and 1190
night, and night's austere constellations, and the night-roving torches and flying flames of heaven,[95] clouds, sunlight, rains, snow, winds, lightning, hail, and the rapid roars and mighty menacing rumbles of thunder.

O hapless humanity, to have attributed such happenings to the gods and to have ascribed cruel wrath to them as well! What sorrows did they then prepare for themselves, what wounds for us, what tears for generations to come! Piety does not consist in veiling one's head and turning with ostentatious frequency to a stone, or in visiting every altar, or in 1200
prostrating oneself on the ground with outstretched palms before the

93. **1161–1193:** On the gods as conceived by the Epicureans, on the cause of our visions of them, and on the importance of worshipping them, see p. xxviii–xxix.

94. **1183–1193:** This second cause of belief in the gods is regarded by Lucr. as false. The Epicureans denied that the gods have any control over celestial phenomena.

95. **1191:** Comets and meteors.

shrines of the gods, or in saturating the sacrificial slabs with the blood of four-footed beasts, or in linking vows to vows, but rather in possessing the ability to contemplate all things with a tranquil mind.

When we look up and survey the celestial precincts of the mighty firmament, and the ether above studded with sparkling stars, and reflect upon the courses of the sun and moon, then in our breasts already burdened with other cares a new fear begins to awaken and lift its head—a fear that there may possibly be some immeasurable divine power above us that wheels the dazzling heavenly bodies on their various courses. Our minds, disturbed by their inadequate knowledge of the truth, are uncertain whether the world had a beginning and birth, and equally whether there is a limit to the ability of the world's walls to endure the strain of restless motion, or whether they are not divinely endowed with everlasting life and so can glide on through an eternal tract of time, defying the strong assaults of measureless ages.

Moreover, whose heart does not contract with dread of the gods, and who does not cower in fear, when the scorched earth shudders beneath the terrible stroke of the thunderbolt, and rumbles of thunder run across the vast heaven? Do not nations and peoples tremble, and do not proud kings shrink in every limb, stricken with terror of the gods, in case the dreadful moment of reckoning has come for some heinous deed or arrogant word?

Again, when the full violence of vehement winds raging at sea sweeps the admiral of a fleet over the ocean plains along with his powerful legions and elephants, does he not attempt to appease the gods with vows? Does he not in his panic pray that the winds may be calmed and succeeded by propitious breezes? But all in vain; for often, despite his prayers, he is seized by the tearing tornado and hurled to his death on the shoals. It all goes to show that there is some invisible force that tramples on human ambitions and seemingly treads underfoot the glorious rods and grim axes of high office,[96] and treats them as its playthings.

Lastly, when the whole earth rocks underfoot, and shaken cities fall or totteringly threaten to fall, is it surprising if mortal beings feel humbled and admit the existence of gods with such vast powers and such stupendous strength that they can govern all things?

Next I must explain that copper,[97] gold, and iron, as well as weighty silver and serviceable lead, were discovered when on the mighty moun-

96. **1234:** See note on 3.996.

97. **1241:** I have translated *aes* "copper" here and in 1257, where mention is made of the discovery of the metal, but "bronze" in 1270–1294, where its use is described. Only bronze, an alloy of copper and tin, would make effective tools and weapons.

tains a fire had consumed vast forests with its flames. The conflagration may have been started by a thunderbolt from the sky, or when, while waging war in the woods, people had set fire to them to strike terror into the enemy, or when, tempted by the richness of the soil, they wished to open up fertile fields and make the countryside fit for pasture, or else when they wanted to kill wild beasts and enrich themselves with game; for the use of pit and fire for hunting preceded the enclosing of covers with nets and driving with dogs. Anyhow, whatever the cause of the conflagration, when the raging flames had devoured the forests to their deepest roots with a terrible crackling noise, and the fire had thoroughly baked the earth, streams of silver and gold and also of copper and lead trickled out of the earth's glowing veins and collected in cavities on the surface. Afterward, when these metals had solidified and people saw them glittering brightly on the ground, they picked them up, captivated by their lovely luster and polish, and observed that in each case their shape corresponded exactly to the outline of the cavities in which they lay. Then it struck them that these metals, when melted, could be made to run into the shape and form of any object they pleased, and furthermore could be hammered out into points and edges of any degree of sharpness and fineness, thus giving them weapons, and enabling them to fell forests and hew timber and plane planks smooth, as well as to drill, punch, and bore holes. And initially they attempted to do these things with silver and gold as much as with the sturdy strength of stubborn bronze. But without success; for these metals, despite their apparent firmness, failed and gave way, lacking bronze's ability to withstand severe strain. At that time bronze was the more highly esteemed, while gold was scorned as useless because it was easily dulled and blunted. Now it is bronze that is scorned, and gold has risen to the highest place of honor. Thus fashions change with the rolling years: what was once esteemed becomes utterly despised; while something else emerges from obscurity to take its place, is more and more sought after day by day, and, once discovered, blossoms into fame and enjoys extraordinary honor among mortals.

Now, Memmius, you yourself can easily deduce how the discovery of iron and its properties came about. Weapons in primitive times were hands, nails, and feet, as well as stones, branches broken from forest trees, and flaming fire as soon as it was known. Later strong iron and bronze were discovered; and the use of bronze preceded that of iron, for it is more malleable and more abundant. With bronze they tilled the soil,

and with bronze they embroiled the billows of war, broadcast[98] wide-gaping wounds, and plundered flocks and fields; for everything unarmed and defenseless readily yielded to the armed. Then by degrees the iron sword came into prominence and the bronze sickle became an object of scorn: with iron they began to furrow the soil, and the chances of unpredictable war were equalized.

Mounting armed on horseback and guiding one's steed with reins while fighting with one's right hand is an earlier practice than braving the perils of war in a two-horsed chariot. And yoking a pair of horses is an earlier practice than yoking two pairs or mounting armed on scythed chariots.[99] Later Lucanian oxen,[100] dreadful snake-handed creatures with turreted backs, were trained by the Carthaginians to endure the wounds of war and make havoc among mighty martial hosts. Thus grim discord produced a succession of new inventions to strike terror into peoples involved in fighting and day by day heightened the horrors of war.

They also tried to use bulls in the work of war and made the experiment of sending savage boars against the enemy.[101] Sometimes too they sent powerful lions ahead of them with armed trainers and cruel masters to restrain them and hold them in leash. But without success; for the savage beasts, maddened by the promiscuous slaughter and tossing their

98. **1290:** The metaphor "broadcast" or "sowed" may well have been prompted by the agricultural reference in the preceding line. For similar thought-links, see notes on 1436, 2.276.

99. **1301:** On scythed chariots, see note on 3.642.

100. **1302:** Elephants, which the Romans first encountered in the army of Pyrrhus, king of Epirus, who invaded Lucania (a region of southern Italy) in 280 B.C. and won the original Pyrrhic victory. For the epithet "snake-handed," see note on 2.537.

101. **1308–1349:** The information (which, as is clear from 1341–1349, is not Lucr.'s own invention) that experiments in battle were made not only with elephants, but also with bulls, boars, and lions, is to be compared with the information that, when metals had been discovered and people wanted to make tools, experiments were made not only with bronze, but also with gold and silver (1269–1272). But surely Lucr. is also making a moral point: whereas in primitive times people ran away from fierce animals, including boars and lions (969, 982–987), and occasionally individuals were eaten alive by them (990–993), in more recent times people deliberately used the same animals in battle. The vivid description of the rampaging beasts probably owes much to observation of scenes in the arena, where killing of and by fierce animals was a favorite Roman entertainment.

terrible manes on every side, confounded the cavalry squadrons, making no distinction between friend and foe; and the horsemen were unable to soothe the spirits of their steeds terror-stricken by the roaring, or to turn them around with the reins to face the enemy. The lionesses launched their frames in furious springs on every side: they flew at the faces of oncoming riders, and surprised others from behind and tore them down from their mounts and, twining around them, hurled them to the ground mortally wounded, gripping them with powerful jaws and hooked claws. The bulls tossed their masters and trampled them underfoot, gored the flanks and underbellies of the horses with their horns, and plowed up the ground in a menacing manner. And the boars killed their allies with their powerful tusks, savagely dyeing with their own blood the darts broken in their bodies, and massacred cavalry and infantry indiscriminately. In attempting to evade the fierce thrust of the tusk, steeds would shy or rear up and paw the air. But all in vain; for you would see them crash down hamstrung and cover the ground in a heavy fall. Even those animals that were thought to have been sufficiently tamed at home beforehand were seen amid the heat of battle to foam in fury, maddened by wounds, shouts, flight, terror, and tumult. And it proved impossible to regain control of any of them; for the various kinds of beasts all scattered this way and that, just as nowadays Lucanian oxen, horribly hacked by the sword, often scatter in all directions after savaging many of their human allies.

But did people really make this experiment?[102] I must confess that I find it almost incredible that they were unable to anticipate and imagine the consequences of their action, before the dreadful common disaster occurred; and it would be easier to maintain that it happened somewhere in the universe of various worlds variously formed than to assign it to any one specific earth. Certainly the experiment must have been inspired not so much by a hope of victory as by a desire to give the enemy cause for sorrow even at the cost of self-destruction, in a situation involving people who distrusted their numbers and were short of arms.

Plaited clothing preceded woven garments.[103] Woven cloth came after iron, which is used for the making of the loom: without iron it is impos-

102. **1341–1349:** Lucr. sensibly finds it hard to believe that people could have been so foolish as to fail to foresee the disastrous consequences of their experiment. In an infinite universe containing an infinite number of worlds there are an infinite number of chances, and such an event might have occurred sometime somewhere, but, if so, only in a situation where people were desperate and wanted to sell their lives as dearly as possible.

103. **1350:** Cf. Diogenes of Oinoanda *fr.* 12.I.10–II.3.

sible to produce instruments of such smoothness as treadles, spindles, shuttles, and noisy leash rods.

And nature obliged men to work wool before women; for the male sex is, generally speaking, far superior in skill and ingenuity. But eventually the sturdy farming folk came to regard the occupation with such contempt that the men willingly left it to women's hands, took their share in enduring tough toil, and with this tough labor toughened their limbs and hands.

As for planting and grafting, the original pattern for these operations was provided by creative nature herself, since fallen berries and acorns in due time produced swarms of seedlings beneath the trees; and this gave people the idea of entrusting slips to branches and of planting young saplings in the earth all over the countryside. Then they kept on experimenting with new methods of cultivating the little plot of land they loved, and saw wild fruits improve in the ground in response to their kindly care and coaxing. And day by day they forced the the forests to retreat farther and farther up the mountains and surrender the parts below to cultivation, so that on hills and plains they might have meadows, ponds, streams, crops, and exuberant vines, and so that the distinctive gray-green zone of olives might run between, spreading over down and dale and plain. They created landscapes such as we see today—landscapes rich in delightful variety, attractively dotted with sweet fruit trees and enclosed with luxuriant plantations.

People imitated with their mouths the liquid warblings of birds long before they were able to join together in singing melodious songs with pleasure to the ear. And it was the whistling of the zephyr in the cavities of reeds that first taught country folk to blow into hollow stalks. Then little by little they learned the sweet notes that ripple from the plaintive pipe as the player's fingers strike the stops[104]—the pipe invented in pathless woods and forests and forest glades, in the solitary spots where shepherds rest in the open air. With this music they would soothe and charm their hearts after they had eaten their fill; for that is the time when everything affords pleasure. So they would often lie in friendly company on velvety turf near a running brook beneath the branches of a tall tree and provide their bodies with simple but agreeable refreshment, especially when the weather smiled and the season of the year embroi-

104. **1385:** Repeated from 4.585.

dered the green grass with flowers.[105] Then there would be jokes, talk, and peals of pleasant laughter; for then the rustic muse was at its best. Then, prompted by playful gaiety, they would deck their heads and shoulders with garlands of interwoven flowers and foliage and move their limbs clumsily in an unrhythmical dance, striking mother earth with clumsy feet. These performances would provoke smiles and peals of pleasant laughter, because all such pastimes, being new and wonderful, had a greater effect at that time. And the wakeful would find ready consolations for sleeplessness in guiding their voices through the many modulations of a song and in running over the reeds with pursed lips. This old tradition is still kept up by watchmen today; and although they have learned to keep time, they do not derive any more pleasure from their music than did those woodland folk, the children of earth.

The fact is that our present possessions, so long as we have not experienced anything more agreeable in the past, please us preeminently and are considered to be the best; but when something superior is subsequently discovered, the new invention usually ousts all the old things and alters our feelings toward them. Thus acorns came to be disliked; thus those beds strewn with grass and heaped high with leaves were abandoned. Thus too the clothing of wild beasts' skins fell into contempt; and yet I suppose that, at the time of its discovery, it excited such envy that its first wearer was waylaid and slain, even though, after all that, the murderers, in squabbling over the garment, ripped it to pieces and besmeared it with blood so that it was ruined and rendered valueless. Then it was skins, now it is gold and purple that plague human lives with cares and weary them with war. And here, I think, the greater blame rests with us today. For whereas the children of earth were tormented by cold when they had no skins to cover their naked bodies, it is no hardship for us to go without robes of purple patterned with great gold-embroidered figures, provided that we have the protection of some common garment.[106] And so human beings never cease to labor vainly and fruitlessly, consuming their lives in groundless cares, evidently because they have not learned the proper limit to possession, and the extent to which real pleasure can increase.[107] And it is this ignorance that has gradually

105. **1392–1396:** Repeated, with minor variations, from 2.29–33. See note there.

106. **1427–1429:** Cf. 2.34–36.

107. **1430–1433:** See pp. xxix–xxx.

carried life out into the deep sea and has stirred up from the depths the mighty boiling billows of war.

It was the watchmen of the sky,[108] the sun and moon, who, as they traveled with their light all round the vast revolving vault, taught people that the seasons of the year roll around, and that everything happens by a fixed law and in a fixed order.

By now people were living their lives surrounded by sturdy fortifications, and the land was divided up and marked out for cultivation. The deep sea was aflower[109] with the flying sails of ships, and already they had confederates and allies under formal treaties, at the time when poets began to record human exploits in song. But the letters of the alphabet were invented only a short time before. Consequently our age cannot look back to earlier events, except insofar as reason reveals their traces.

Navigation, agriculture, city walls, laws, arms, roads, clothing, and all other practical inventions as well as every one of life's rewards and refinements, poems, pictures, and polished statues of exquisite workmanship, all without exception were gradually taught by experience and the inventiveness of the energetic mind, as humanity progressed step by step. Thus by slow degrees time evolves every discovery, and reason raises it up into the regions of light. People saw one thing after another become clear in their minds until each art reached the peak of perfection.

108. **1436:** The metaphorical use of "watchmen" here was probably prompted by the reference to human watchmen in 1408. See 1290 and 2.276 for metaphors generated in a similar way.

109. **1442:** "Aflower" no doubt refers primarily to the colorful and petal-like appearance of the ships' sails, but also suggests large numbers of vessels sailing the seas in prosperous circumstances.

BOOK SIX

Preface

Atmospheric Phenomena

Pestilences