

Excerpts from Lucretius (99-55 BCE), *On the Nature of Things*

But since I have revealed that particles, the most solid bits of matter, always move to and fro and never-ending time does not destroy them, come now, let us see whether or not the total sum of them has any limit; let us survey as well that empty region we have discovered, or the place and space where all things happen, and learn whether, in its entirety, it is wholly limited or stretches to infinite, immeasurable depths.

All that exists, then, has no boundaries in any direction, for if it did, it would have to have something outside it. We see there can be no end to something, unless there exists something beyond it which sets that limit, so one may observe where our natural senses cannot follow any further. Now, since we must admit that nothing exists outside the total, it has no boundary—it is without end, without limit. And it does not matter where in it you stand—whatever station someone occupies, he leaves the total just as infinite in all directions. Further, if we suppose all existing space is now finite and if a man ran through to its ultimate limit and then hurled a flying spear, would that spear thrown full strength fly out very far in the direction it was sent, or do you think that something could stop and block it? For you must concede and grant one of these two alternatives. Either one of these cuts off your escape, forcing you to agree the universe lies open without limit. For whether there is some object which obstructs the spear and prevents it going out where it was sent and reaching its goal, or whether that spear is carried forward, its flight did not start from any limit

And so this terror, this darkness of mind, must be dispelled, not by rays from the sun or bright shafts of daylight, but by reason and the face of nature. And we will start to weave her first principle as follows: nothing is ever brought forth by the gods from nothing. That is, of course, how, through fear, all mortal men are held in check—they view many things done on earth and in the sky, effects whose causes they cannot see at all, and so they assume that such things happen because of gods. Hence, once we understand that nothing can be produced from nothing, then we shall more accurately follow what we are looking for, how everything can be created and all work can be done without any assistance from the gods.

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But some men oppose these views, ignoring that particles of matter on their own keep on moving—time does not wear them down. They claim that without power of the gods nature could not, in ways which match so well the needs of man, change seasons of the year, produce the crops, and other things as well, which sacred pleasure urges mortal men to undertake, while she herself, life's guide, leads on and coaxes them to reproduce, through acts of Venus, their generations, lest the human race die out. When they think gods produced each thing for human beings, they seem, in all respects, to have fallen a long, long way from proper reasoning. For even if I were quite ignorant about primordial elements of things, I would, on the basis of the sky itself and many other reasons, dare to claim and to assert the nature of the world was not, in any way, designed for us by the power of gods, for as it stands, it has enormous flaws. But these issues, Memmius, we will clarify for you later on—at this point I will explain what there is still left to say on motion.

To start with, we know that in every part, in all directions and on either side, above and below and throughout all space, there is no limit, as I have explained, and facts themselves announce it on their own—the nature of deep space is very clear. Since infinite space lies empty on all sides and seeds in countless numbers fly around through the deep universe in various ways, driven by eternal motion, we must not, in any way, now think it probable that only this one sphere of earth and sky have been created, that beyond us here all those many particles of matter do nothing at all, especially since earth was made by nature. Seeds of things themselves, jostling freely here and there in various ways and forced to random, confused collisions, produced nothing—then finally those ones suddenly united which could become, every time, the beginnings of great things, land, sea, sky, the race of living beings. And so, to repeat myself, you must grant that there are other aggregates of matter similar to this in other places, which aether clutches in its keen embrace.