Episode Seventy-One - The Formation Of the World (Our Part of the Universe)

Post by “Cassius” of May 15, 2021 at 2:01 PM

Welcome to Episode Seventy-One of Lucretius Today.

I am your host Cassius, and together with my panelists from the EpicureanFriends.com forum, we'll walk you through the six books of Lucretius' poem, and discuss how Epicurean philosophy can apply to you today. We encourage you to study Epicurus for yourself, and we suggest the best place to start is the book, "Epicurus and His Philosophy" by Canadian professor Norman DeWitt.

For anyone who is not familiar with our podcast, please check back to **Episode One** for a discussion of our goals and our ground rules. If you have any question about that, please be sure to contact us at EpicureanFriends.com for more information.

In this Episode 71 we will read approximately Latin line 416 -508 of Book V, and we will talk about the formation of our world from the fundamental elements. Now let's join Martin reading today's text.

Munro Notes-

416-431: I will now describe how the various parts of the world were formed: as we said above, it was not by design that atoms framed it; but after many fruitless collisions, they chanced to fall into such motions as produced the world and all that is in it.

432-448: then could be seen nothing that now is seen, sun stars earth sea or heaven, but a strange chaotic jumble of atoms unable to combine: gradually the different parts of the world began to separate.

449-494 : the heavy particles of earth collected in the midst and squeezed out the lighter atoms of the other parts of the world : ether with its fires first burst forth and collecting on high formed the outer-most sphere of the world; between it and earth the rudiments of sun and moon and stars took up their position; the earth, rid of these lighter particles, sank down still more where the bed of ocean is; and these depressions were flooded with salt water; and the more the earth was beaten upon by the heat of ether and the sun, the more it was condensed, and thus increased the ocean by particles of moisture squeezed out of it, and the heaven by elements of fire which flew off from it.

495-508: thus the earth sank to the bottom, and sea air and ether were left separate, ether above all, which glides on its even way and mixes with none of the lower elements.

Browne 1743

But now I shall explicate in order by what chance the violent agitation of matter produced the heavens, and the earth, and the deeps of the sea, and the courses of the sun and moon. For surely the principles of things could never fall into so regular a disposition by counsel or design, nor could they by agreement resolve what motions they should take among themselves. But the seeds of things, being from eternity beaten upon by outward blows, or used to be driven by the force of their own weight, met every way, tried all motions that might at last, by their uniting, end in the production of things; and then having attempted for an infinite time all sorts of union, and moved every way about, those seeds at length met and united, and became the principles of the great productions that followed, of the Earth, the Sea, the Heavens, and the whole animal creation.

But as yet there was no chariot of the sun to be seen, driving with his large stock of light through the sky; no sea, no heavens, no air, nothing like any beings of this world of ours to be seen; but a strange confusion, a mass of rude and undigested seeds. From this heap the various parts retired to their proper place, and seeds of like nature joined together and formed this world. Then were its mighty parts divided, and disposed in order, though produced from this confused mass, and from seeds of every kind; for the disagreeing powers of those seeds so disturbed their several courses, intervals, connections, weights, strokes, unions, and motions, and kept them so continually at war, that they could never all unite, nor agree upon any regular motions among themselves. Thus the heavens separated, and raised their bodies on high above the earth, and the sea, with its vast extent of collected waters, retired apart, and the pure and bright fires of the sky fled upwards and divided from the rest.

And first, the particles of earth, being heavy and entangled, met and sunk downwards towards the middle place of the mass, and the more closely twined the parts of it were, the more they squeezed out those seeds that composed the sea, the stars, the sun, and that formed the moon, and the heavens (the walls of this great world). For these consist of seeds much more smooth and round, and of much less principles than the Earth, and therefore the heavens (the abode of the stars) first got free through the subtle pores of the Earth, and ascended upwards; and being light, drew many seeds of fire along with them, much in the same manner with what we frequently observe when the golden rays of the bright morning sun first shine upon the grass decked with pearly dew, and the standing lakes and running rivers exhale a mist into the air, and the Earth sometimes seem to smoke. These vapors, when they are raised upwards and united, become clouds, and with their condensed bodies darken the whole sky, and so the light and spreading ether, being condensed, stretches widely over every place, and being diffused on all sides abroad, embraces every thing with its large circumference, and encloses it about.

The beginnings of the sun and moon follow next, whose orbs are rolled in the air between the ether and the Earth, and whose principles would unite neither with those of the Earth nor the Sky; they had not weight enough to sink so low as the one, nor were they sufficiently light to rise so high as the other; yet they are so placed between both that they constantly turn about their bodies, and so become parts of the whole world. As in these bodies of ours, some members are continually at rest when others are always in motion. These things being separated, a great part of the earth sunk suddenly, and made a channel where the tides of the sea now flow, and formed a cavern for the salt waters. And the more the heat of the sky and the beams of the sun pressed every way with frequent strokes upon the Earth, full of pores on the outside (that so its particles, being driven towards the middle, might be more firm and condensed) the more the salt water like sweat was squeezed out, and by flowing enlarged the surface of the sea, and spread wider abroad; and the more the many corpuscles of fire and air disentangled themselves and flew off from the Earth, and formed themselves above, at a great distance, into the shining frame of the heavens. The valleys subsided, the mountains raised their lofty heads, nor could the rocks sink down, nor all parts of the Earth fall equally low. And thus the weight of the Earth, with its heavy body, stood firm, and its whole mass, like thick mud, fell to the bottom, and sunk the lowest, as the dregs of all.

Munro 1886

But in what ways yon concourse of matter founded earth and heaven and the deeps of the sea, the courses of the sun and moon, I will next in order describe. For verily not by design did the first-beginnings of things station themselves each in its right place by keen intelligence, nor did they bargain sooth to say what motions each should assume, but because the first-beginnings of things many in number in many ways impelled by blows for infinite ages back and kept in motion by their own weights have been wont to be carried along and to unite in all manner of ways and thoroughly to test every kind of production possible by their mutual combinations, therefore it is that spread abroad through great time after trying unions and motions of every kind they at length meet together in those masses which suddenly brought together become often the rudiments of great things, of earth sea and heaven and the race of living things.

At this time then neither could the sun’s disk be discerned flying aloft with its abundant light, nor the stars of great ether, nor sea nor heaven, no nor earth nor air, nor could any thing be seen like to our things, but only a strange stormy crisis and medley, gathered together out of first-beginnings of every kind, whose state of discord joining battle disordered their interspaces passages, connections, weights, blows, clashings, and motions, because by reason of their unlike forms and varied shapes they could not all remain thus joined together nor fall into mutually harmonious motions. Then next the several parts began to fly asunder and things to be joined like with like and to mark off the world and portion out its members and arrange its mighty parts, that is to say, to separate high heaven from earth, and let the sea spread itself out apart with its unmixed water, and likewise let the fires of ether spread apart pure and unmixed.

For first the several bodies of earth, because they were heavy and closely entangled, met together in the middle and took up all of them the lowest positions; and the more they got entangled and the closer their union, the more they squeezed out those particles which were to make up sea stars sun and moon and the walls of the great world. All these are of smooth and round seeds and of much smaller elements than the earth. Therefore the fire-laden ether first burst out from the different parts of the earth through all the porous openings and lightly bore off with itself many fires; much in the same way as we often see, so soon as the morning light of the beaming sun blushes golden over the grass jeweled with dew, and the pools and the ever-running rivers exhale a mist, and even as the earth itself is sometimes seen to smoke; and when all these are gathered together aloft, then do clouds on high with a now cohering body weave a covering beneath heaven. In this way therefore then the light and expansive ether with its now cohering body swept round and arched itself on all sides and expanding widely in all directions round in this way fenced all other things in with its greedy grasp.

After it followed the rudiments of sun and moon, whose spheres turn round in air midway between earth and ether: these neither earth has taken unto itself nor greatest ether, because they were neither heavy enough to sink and settle down nor light enough to glide along the uppermost borders; they yet however are so placed between the two as to wheel along their life-like bodies and still to be parts of the whole world; just as in us some members may be at rest, while others at the same time are in motion. These things then being withdrawn, the earth in those parts where the vast azure level of ocean now spreads, in a moment sank in and drenched with salt flood the hollows. At every day the more the heats of ether round and the rays of the sun on all sides compressed the earth into a close mass by oft-repeated blows on all its outer edges, so that thus buffeted it was condensed and drawn together about its center, ever the more did the salt sweat squeezed out of its body increase by its oozings the sea and floating fields, and ever the more did those many bodies of heat and air escape and fly abroad and condense far away from earth the high glittering quarters of heaven. The plains sank down, the high hills grew in elevation; for the rocks could not settle down nor all the parts sink to one uniform level. Thus then the ponderous mass of earth was formed with close-cohering body and all the slime of the world so to speak slid down by its weight to the lowest point and settled at the bottom like dregs.

Bailey 1921

But by what means that gathering together of matter established earth and sky and the depths of ocean, and the courses of sun and moon, I will set forth, in order. For in very truth not by design did the first-beginnings of things place themselves each in their order with foreseeing mind, nor indeed did they make compact what movements each should start; but because many first-beginnings of things in many ways, driven on by blows from time everlasting until now, and moved by their own weight, have been wont to be borne on, and to unite in every way and essay everything that they might create, meeting one with another, therefore it comes to pass that scattered abroad through a great age, as they try meetings and motions of every

kind, at last those come together, which, suddenly cast together, become often the beginnings of great things, of earth, sea and sky, and the race of living things.

Then, when things were so, neither could the sun's orb be seen, flying on high with its bounteous light, nor the stars of the great world, nor sea nor sky, nay nor earth nor air, nor anything at all like to the things we know, but only a sort of fresh-formed storm, a mass gathered together of first-beginnings of every kind, whose discord was waging war and confounding interspaces, paths, interlacings, weights, blows, meetings, and motions, because owing to their unlike forms and diverse shapes, all things were unable to remain in union, as they do now, and to give and receive harmonious motions. From this mass parts began to fly off hither and thither, and like things to unite with like, and so to unfold a world, and to sunder its members and dispose its great parts, that is, to mark off the high heaven from the earth, and the sea by itself, so that it might spread out with its moisture kept apart, and likewise the fires of the sky by themselves, unmixed and kept apart.

Yea, verily, first of all the several bodies of earth, because they were heavy and interlaced, met together in the middle, and all took up the lowest places; and the more they met and interlaced, the more did they squeeze out those which were to make sea, stars, sun, and moon, and the walls of the great world. For all these are of smoother and rounder seeds, and of much smaller particles than earth. And so, bursting out from the quarter of the earth through its loose-knit openings, first of all the fiery ether rose up and, being so light, carried off with it many fires, in not far different wise than often we see now, when first the golden morning light of the radiant sun reddens over the grass bejewelled with dew, and the pools and ever-running streams give off a mist, yea, even as the earth from time to time is seen to steam: and when all these are gathered together as they move upwards, clouds with body now formed weave a web beneath the sky on high. Thus then at that time the light and spreading ether, with body now formed, was set all around and curved on every side, and spreading wide towards every part on all sides, thus fenced in all else in its greedy embrace.

There followed then the beginnings of sun and moon, whose spheres turn in air midway betwixt earth and ether; for neither earth nor the great ether claimed them for itself, because they were neither heavy enough to sink and settle down, nor light enough to be able to glide along the topmost coasts, yet they are so set between the two that they can move along their living bodies, and are parts of the whole world; even as in our bodies some limbs may abide in their place, while yet there are others moving. So when these things were withdrawn, at once the earth sank down, where now the vast blue belt of ocean stretches, and flooded the furrows with salt surge. And day by day, the more the tide of ether and the rays of the sun with constant blows along its outer edges constrained the earth into closer texture, so that thus smitten it condensed and drew together round its centre, the more did the salt sweat, squeezed out from its body, go to increase the sea and the swimming plains, as it trickled forth; yea, and the more did those many bodies of heat and air slip forth and fly abroad, and far away from earth condense the high glowing quarters of the sky. Plains sank down, lofty mountains grew in height; for indeed the rocks could not settle down, nor could all parts subside equally in the

same degree. So then the weight of earth, with body now formed, sank to its place, and, as it were, all the slime of the world slid heavily to the bottom, and sank right down like dregs....

Post by “Cassius” of May 18, 2021 at 5:31 PM

Here's a note I am making while editing this week's podcast. Around the 20 minute mark I mention that I have a hard time remembering whether the swerve was attributed by Lucretius as playing a part of the formation of worlds. As I write this I think the answer is yes, but it's interesting to correlate that with the letter to Herodotus, because in that letter Epicurus has a description of the formation of worlds but he does NOT mention the swerve. That's one part that's relatively easy to remember, because I seem to remember the commentators have a consensus that but for Lucretius and Cicero (and perhaps some other later sources, but I'm not sure) we would not know about the swerve from the letters of Epicurus himself. And it's interesting there to remember that Laertius was writing long after Lucretius and Cicero, so presumably Laertius did or should know about the swerve theory.

Post by “Joshua” of May 18, 2021 at 8:22 PM

I'll have to dig up a citation later, but Lucretius does indicate that the swerve (clinamen) is foundational to cosmology. This is the troubling bit about the "original" motion of the atoms as falling like rain through the void. The swerve comes in because a uniform and parallel "falling" of atoms at a constant rate of motion would preclude these atoms ever commingling. An indeterminate swerve is essential in order to get them bouncing off each other.

I haven't listened yet, you might have covered that already!

Edit;

> Quote
>
> Here's a note I am making while editing this week's podcast.

Well...I clearly cannot have listened yet! 

Post by “Joshua” of May 18, 2021 at 8:25 PM

Citation here (scroll for quote).

Post by “Cassius” of May 19, 2021 at 1:04 AM

Joshua have you compared that to the letter to Herodotus?

Post by “Cassius” of May 19, 2021 at 1:08 AM

> Quote
>
> And the atoms move continuously for all time, some of them falling straight down, others swerving, and others recoiling from their collisions.
>
> And of the latter, some are borne on, separating to a long distance from one another, while others again recoil and recoil, whenever they chance to be checked by the interlacing with others, or else shut in by atoms interlaced around them.

Maybe I am wrong to think that commentators assert that the swerve is not in Herodotus, because Bailey uses that word in the above excerpt from his translation of it. Or maybe its really a different word, or the point is that Lucretius' version is significantly more detailed.

The letter also says that the universe as a whole is now as it always has been, so maybe the thought that there was ever a "first" swerve leading to the atoms getting entangled is the inconsistent piece, and maybe that was and remained Epicurus' own position.

I would think Epicurus would have held tightly to the view that while we can look narrowly at "local" events as having "firsts" and "lasts," that as to the universe as a whole there is and never has been anything truly new.

Post by “Cassius” of May 19, 2021 at 1:30 AM

Here's what I was probably remembering as to there being nothing in the letter to Herodotus (or the other letters) from Epicurus himself. This is from A.A. Long's "Chance and Natural Law in Epicureanism." Maybe the word Bailey translates as "swerve" is something else, or maybe the … say.

Up to the year 1879 it seems to have been generally assumed that human action is the only sphere of spontaneous or undetermined movement in the world of Epicurus.[8] This is the significant exception to the strictly mechanical causation or necessary chain of events which is otherwise evident in phenomena. Human freedom was accounted for by an exceptional form of motion, the 'swerve' of atoms, and this 'minimal' deviation was also invoked to explain the 'theoretical' first contact between atoms from which worlds arise. These, in fact, are the only functions of the swerve which are mentioned explicitly in Lucretius, and no word from Epicurus himself on the swerve has been discovered.[9] In the year I have just mentioned, M. Guyau published *La morale d'Épicure* in which he argued that Epicurus extended the function of the swerve to cover spontaneous happenings in the world now (pp. 72-102). At the time when he wrote, Guyau's attribution of spontaneity to nature was not accepted by most scholars.[10] But the effects of his work are still apparent. In 1972 J. M. Rist wrote: 'there is a random element, an element of chance in nature, and Guyau was probably right in holding that Epicurus attributed it to the swerve of atoms' (p. 52).[11]

But is there a 'random element, an element of chance in nature', as Epicurus conceives of the world?

In discussing this question it is most important to be clear about

[6] The standard criticism is that Epicurus introduced an inexplicable form of spontaneous movement in order to preserve human freedom, see the passages in Usener 281.
[7] Cf. Solmsen (1951) p. 19.
[8] See Guyau p. 86. For the same view in modern books, see De Witt p. 175 and Farrington p. 8.
[9] Brieger's view that the swerve was only introduced by later Epicureans was effectively criticized by Giussani (i pp. 129 ff.) and has not been accepted by later scholars.
[10] See the sound criticism by Zeller n. 5 pp. 421-2 and Hicks pp. 260 f.
[11] Bailey, who consistently attributed 'real contingency in nature' to Epicurus, was sceptical about Guyau's link between contingency and the swerve in 1928, p. 326. But in 1947 he found Guyau probably right (p. 840). Philod. *On signs* col. xxxvi.11 seems to have resolved his earlier doubts. This passage is discussed below, p. 86.

Post by "Cassius" of May 19, 2021 at 1:33 AM

Well here ya go again - I guess my memory was a little better than I thought. Here's David Sedley - the phrase "does not feature" is not the same as "does not appear" but i tend to think "does not appear" is probably what he means given the "nonetheless amply attested as his" (?) My tendency at this point is to question Bailey's translation.

David Sedley

1. The Swerve

A few facts are, I hope, uncontroversial enough to be set out without defence. Epicurus inherited Democritus' atomic system, but modified it in a number of respects. In particular, he so vehemently objected to its rigidly deterministic laws as to postulate a minimal 'swerve' (παρέγκλισις) in the motion of atoms, occurring at no fixed place or time — a doctrine which does not feature in his meagre surviving writings but is nonetheless amply attested as his; and defended on his behalf by Lucretius (II 216-93). The swerve (a) enables atoms falling through space at equal speed in parallel lines to collide occasionally and initiate cosmogonic patterns of motion; and (b) somehow or other serves as a necessary condition for the behavioural autonomy of animate beings — a power often identified as 'free will'.

The latter function of the swerve has been widely debated, but no general agreement has been reached on its inter-

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Post by "Cassius" of May 19, 2021 at 1:40 AM

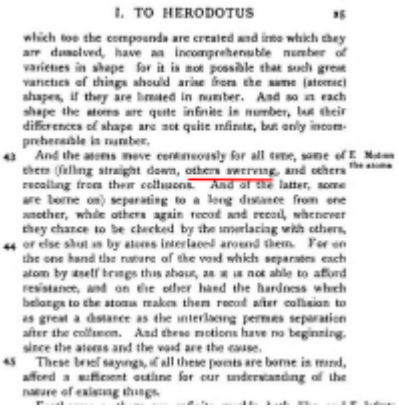
More Sedley from the same article, and this time he says: "contain no hint." More weight to the "Bailey uses the wrong word" possibility:

accuracy (Lucretius II 246-50).

I do not propose to expend much discussion on the swerve's cosmogonical function (Lucretius II 216-42), which I suspect to be a problem dreamed up with a preconceived solution in mind. Chains of atomic collisions in extra-cosmic space could have quite adequately been explained by the lateral intrusion of one or more atoms from elsewhere, despatched, say, by the break-up of a nearby world. The question of how such collisions ever started in the first place would not arise, given the infinity of past time and past worlds. That is, indeed, the view strongly implied by the *Letter to Herodotus* and the *Letter to Pythocles*,[4] the physical epitomes which Epicurus wrote when he had already worked out his main cosmological views in Books I-XIII of his *On nature*. Since these two works also contain no hint of the swerve doctrine, the likelihood is that it was his later work on psychology, apparently in the closing books of the thirty-seven book magnum opus, that led him to the innovation, and that it was only then grafted onto the existing cosmological scheme.[5]

J. C. S. Peirce, *Collected papers* 6 (1935), esp. p. 35–37.

And just to be sure I am not misquoting Bailey in the "Core Texts" page here, here is a screenshot from "Epicurus, the Extant Remains" - Apparently Sedley thinks that whatever is translated here as "*some swerving*" is really "no hint of the swerve doctrine."



I. TO HERODOTUS 95

which too the compounds are created and into which they are dissolved, have an incomprehensible number of varieties in shape for it is not possible that such great varieties of things should arise from the same (atomic) shapes, if they are limited in number. And so in each shape the atoms are quite infinite in number, but their differences of shape are not quite infinite, but only incomprehensible in number.

43 And the atoms move continuously for all time, some of E. Motion of the atoms them (falling straight down, others swerving, and others recoiling from their collisions. And of the latter, some are borne on) separating to a long distance from one another, while others again recoil and recoil, whenever they chance to be checked by the interlacing with others,

44 or else shut in by atoms interlaced around them. For on the one hand the nature of the void which separates each atom by itself brings this about, as it is not able to afford resistance, and on the other hand the hardness which belongs to the atoms makes them recoil after collision to as great a distance as the interlacing permits separation after the collision. And these motions have no beginning, since the atoms and the void are the cause.

45 These brief sayings, if all these points are borne in mind, afford a sufficient outline for our understanding of the nature of existing things.

Post by "Joshua" of May 19, 2021 at 7:10 AM

Good stuff, Cassius! I think we've talked about the "original" motion of the atoms recently–perhaps last twentieth? I certainly find it incredibly puzzling.

I'm sure I've read it somewhere, but I can't even think what the Greek word for *clinamen* would be. Maybe Don can shed some light on Bailey's translation at some point.

Post by “Cassius” of May 19, 2021 at 7:27 AM

only ungraspable.

43.[3] And the atoms move continuously[4] for all time, some recoiling far apart from one another [upon collision], and others, by contrast, maintaining a [constant] vibration when they are locked into a compound or enclosed by the surrounding [atoms of a compound]. 44. This is the re-

2. The scholiast adds: "This is also in book one of the *On Nature* and in books fourteen and fifteen, as well as in the *Major Summary*."

3. Scholiast: "A bit later he also says that division does not go on indefinitely; and he says since the qualities change, unless one intends simply to extend them indefinitely with respect to their magnitudes too." This scholion is probably corrupt, and the sense is unclear.

4. Scholiast: "and he says a bit later that they also move with equal speed since the void gives an equal yielding [i.e., lack of resistance] to the lightest and to the heaviest."

ompare. I think we have public domain). Also we

sult of the nature of the void which separates each of them and is not able to provide any resistance; and their actual solidity causes their rebound vibration to extend, during the collision, as far as the distance which the entanglement [of the compound] permits after the collision.

There is no principle for these [entities], since the atoms and the void are eternal.[5] 45. If all these points are remembered, a maxim as brief as this will provide an adequate outline for [developing] our conceptions about the nature of what exists.

Moreover, there is

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Post by “Godfrey” of May 19, 2021 at 4:51 PM

This idea of continuous motion and vibration, to me, makes much more sense than the swerve!

Also from Herodotus:

> Quote
>
> 60. Further, one must not assert that the unlimited has an up and a down in the sense of an [absolutely] highest and lowest point. We know, however, that what is over our heads from wherever we stand, or what is below any point which we think of—it being possible to project both indefinitely—will never appear to us as being at the same time and in the same respect both up and down. For it is impossible to conceive of this. Consequently, it is possible to grasp as one motion the one conceived of as indefinitely [extended] upwards and the one conceived of as indefinitely [extended] downwards, even if a thousand times over a thing moving from us towards the places over our heads should arrive at the feet of those above us or a thing moving from us downwards should arrive at the head of those below us.

Post by “Don” of May 19, 2021 at 5:13 PM

The sound of that makes me think that he was talking about standing on a sphere.

Post by “Don” of May 19, 2021 at 5:49 PM

> Quote from JJElbert
>
> I'm sure I've read it somewhere, but I can't even think what the Greek word for clinamen would be. Maybe Don can shed some light on Bailey's translation at some point.

The word there appears to be κεκλιμέναι (keklimenai), the perfect middle/passive participle:

κλῑ́νω • (klī́nō)

1. to bend, slant
2. to cause to give way, cause to retreat
3. to lean, prop something on another

4. to turn aside
5. to decline, wane
6. to seat, cause to lie down
7. (grammar) to inflect, decline, conjugate
8. (passive) to lean, be sloping
9. (passive) to wander, stray

Post by “Cassius” of May 19, 2021 at 6:28 PM

That makes Bailey sound more reasonable. Hard to say why Sedley and Long are so sure otherwise. I guess it doesn't include no fixed time and no fixed place.

I have the podcast edited so will be posting in next couple of hours at most.

Post by “Joshua” of May 19, 2021 at 7:43 PM

Thank you Don and Godfrey!

Post by “Godfrey” of May 19, 2021 at 8:17 PM

Hicks and Yonge both use "rebound," as does Mensch, although she seems to arrange the passage differently:

> Quote
>
> 44 The atoms are in constant motion for eternity. [He says later on that they also move with equal velocity, the void yielding equally to the lightest and the heaviest.] Some travel great distances from one another, while others continue to oscillate in place when they find themselves entangled or enclosed in a mesh of atoms. 45 This is because each atom is separated from the rest by void, which cannot provide any resistance; and the atom’s solidity makes it rebound after any collision, no matter how distant, whereupon it finds itself entangled in a mesh of atoms. Of these motions there

> is no beginning, since they are caused by the atoms and the void.

Post by “Cassius” of May 19, 2021 at 9:23 PM

Episode 71 of the Lucretius Today Podcast is now available. In this episode, we will read approximately Latin line 416 -508 of Book V, and we will talk about the formation of the world (which in Epicurean terms is not the whole universe, but our local part of it, from the fundamental elements. As always, please let us know any comments or questions in the thread below:

https://www.spreaker.com/episode/44919218

Post by “Cassius” of May 19, 2021 at 9:34 PM

I was looking back at Munro's notes as I was posting this week's episode:

> Quote
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> 416-431: I will now describe how the various parts of the world were formed: as we said above, it was not by design that atoms framed it; but after many fruitless collisions, they chanced to fall into such motions as produced the world and all that is in it.

I think we can all understand Munro's phrasing, and how most people would relate to it. But I don't think Epicurus/Lucretius would agree with it - especially the word "fruitless." This phrasing gives the impression that for an eternity before us the atoms were working on rearranging themselves all so they could arrive at the beneficent arrangement in which they find themselves in the month of May in the year of our lord 2021. Or at least the year 5000 BC or 10 billion or whatever starting point you'd like to affix as particularly significant. (I think in my case I'll pick 753 BC for the founding of Rome!)

I doubt seriously whether that kind of perspective is consistent with what Epicurus wanted to convey  The motion of the atoms has never been any more or less "fruitless" (in the sense of reaching some point of particular importance to Nature) than the motion that's going on today. There's both no starting point and no end point from the Epicurean perspective.

Post by “Don” of May 19, 2021 at 10:07 PM

BTW, the RadioLab episode I reference is available for listening here: https://www.wnycstudios.org/podcasts/radio…ticles/bit-flip

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Post by “Don” of May 20, 2021 at 7:33 AM

That list we discussed in Latin:

intervalla vias conexus pondera plagas

concursus motus turbabat proelia miscens

Browne:

intervals, connections, weights, strokes, unions, and motions, and kept them so continually at war,

Google translate:

Intervals between these ways weights blows

emotional disturbance mixing melee battles

For different shapes and various shapes;

intervalla

intervallum n (genitive intervallī); second declension

- The open space within the vallum of a camp or between palisades or ramparts.

- interval, distance

- interval of time, pause, intermission

- difference

- (music) interval

vias

via f (genitive viae); first declension

- road, street, path

- highway

- way, method, manner, mode

- the right way

- (figuratively) journey, course, route

conexus

cōnexus (conn-), ūs, m. conecto,

I.a joining together, combination, connection (several times in Lucr., elsewh. rare), Lucr. 3, 556; Vitr. 10, 1, 5.—In plur., Lucr. 1, 634; 2, 726; 2, 1020; 5, 443.

pondera

pondus n (genitive ponderis); third declension

- weight

- weight of a pound

- heaviness, weight of a body

- load, burden

- quantity, number, multitude

- consequence, importance

- (of character) firmness, constancy

plagas

plāga f (genitive plāgae); first declension

- plague, misfortune

- stroke, blow, cut, strike

- wound, gash, injury

concursus

concursus (feminine concursa, neuter concursum); first/second-declension participle

- flocked

- concurred

- coincided

motus

mōtus (feminine mōta, neuter mōtum); first/second-declension participle

- moved, stirred, disturbed, having been moved

- aroused, excited, begun, inspired, having been aroused

- troubled, concerned, tormented, having been troubled