Thinking About Epicurean Viewpoints Such As The Eternal / Infinite Universe, And How To Discuss Them

Post by “Cassius” of January 10, 2021 at 12:29 PM

This is a thread to discuss general issues as to how modern-day Epicureans should think today about Epicurus' views on the age and size of the universe. The same questions arise as to infinite divisibility, whether the universe has a center, and other issues as well, but probably it would be best to focus on Epicurus' views on the eternality and infinity of the universe as presenting the clearest field for debate.

If you check Wikipedia under "Age of the Universe" you will find the answer defined in terms of "the time elapsed since the Big Bang." which is listed at being somewhere around 14 billion years. Wikipedia further states that the "steady-state model" is now rejected by the vast majority of cosmologists, astrophysicists and astronomers, as the observational evidence points to a hot Big Bang cosmology with a finite age of the universe, which the steady-state model does not predict.

As to the size of the universe, wikipedia is less harsh on the Epicurean position, restricting its position to the "observable universe:"

Because we cannot observe space beyond the edge of the observable universe, it is unknown whether the size of the universe in its totality is finite or infinite.[3][57][58] Estimates suggest that the whole universe, if finite, must be more than 250 times larger than the observable universe.[59] Some disputed[60] estimates for the total size of the universe, if finite, reach as high as _____ as implied by a suggested resolution of the No-Boundary Proposal.[61][b]

How do we approach talking about these issues in an Epicurean context? Most of us (certainly including me) are not astrophysicists, and we don't have any direct evidence other than our own personal observations of life here on Earth and what we can see into the sky. Based on simple human observations that here on earth nothing comes from nothing and nothing goes to nothing, Epicurus erected a chain argument that ultimately in its widest sense the universe must be eternal in time and infinite in size in order for what we see here on Earth to make sense.

Most ordinary people do not have training in astrophysics, and if they are going to take the analysis beyond Epicurus' chain reasoning they will have to decide what they are going to believe based on testimony of "experts" who tell us that they have data and analysis that leads them in a particular direction. It probably isn't necessary to point out, however, that not all experts always agree, and that even when a majority agree on a particular position, "majorities

of experts" in human history have regularly been wrong on any number of positions. Yet on the other hand, majorities of experts are frequently correct, and we have a wonderful world of technology and science that is built on foundations of scientific consensus that have proven to be very reliable.

Before we go further it's worth pointing out that Epicurus' method of reasoning was to first make observations of the evidence that is available to us here on earth, and then on the basis of analogy attempt to deduce conclusions on matters for which we lack the ability to get up close to make direct observation. This is the case not only in astronomy but also in terms of the atom - no one in Epicurus' time ever observed an "atom" directly, and even what we call "atoms" today (which are divisible, and thus not strictly what Epicurus was referring to) are difficult to observe directly. Nevertheless Epicurus made many insightful observations about the nature of atoms by drawing inferences based on analogy with things that could be soon.

Epicurus also recognized the limits of reasoning by analogy, and he affirmed especially in relation to the study of the stars that we regularly do not have enough evidence to select only one theory from among the many theories that can seem possible based on the evidence, and in such cases the only responsible course is to admit that the various possibilities which the evidence does not contradict could in fact be true, and not attempt to select among them.

So how do we approach the issues of infinity and eternality?

As to eternality, as I see it we do have evidence indicating that the universe is eternal, just as Epicurus reasoned. For every day of my life, and to the best of my credible reading every day of every other human's life in the past, nothing has ever been seen to go to nothing, and nothing has ever been seen to come from nothing. To me that is strong evidence that the rule of nothing from nothing and nothing to nothing is correct, and I have no reason to suspect that it is not correct throughout the universe. I therefore would not admit that we have no evidence for the conclusion that the universe as a whole is eternal.l

In the face of this, a certain number, and perhaps a strong majority, of professional physicists have accumulated some very interesting data about the nature of the universe. One thing I observe about those physicists is that they do not seem to agree among themselves about the interpretation of that data. We can pretty easily google and come up with links that reference scientists who do continue to hold that the data indicates that the universe as a whole is eternal in time. It appears that everyone's data, however tends to point to a "big bang" that occurred in at least one area of the total universe about 14 billion years ago. As I see it, that does not cause me a bit of concern, because the scientists appear to me to admit that they are talking about only the "observable" universe, and so the observation that in one segment of the universe the matter expanded or exploded from a smaller mass would in no way violate the rule of nothing from nothing nothing to nothing which all of human sensation has otherwise indicated to be true. There seems to be no reason to argue that that mass came from nowhere, and the observable universe limitation means that the rest of the universe is not even being

addressed, so accepting a "big bang" in our corner of the universe is entirely consistent with the universe as a whole continuing on from eternity, perhaps with an unending series of expansions and contractions throughout the entire whole.

The suggestion seems to be made, however, that "the universe as a whole" might have come from nothing, or that "we don't know" is an acceptable resting point for the analysis. Either contention leads to a confrontation between the observations I myself have made, plus what seems to be reliable evidence of all humans who have ever lived in the past against a contention made by specific experts on the basis of very complicated calculations and observations that are disputed by members of their own field. When I consider the caveats that the experts use like referring to the "observable universe," it seems to me to be very reasonable to consider that the observations made by the latest technology may be explainable by other means without the need to throw out the eternal universe starting point. So based on this analysis it seems to me this situation is far from being conclusive enough to simply say "Epicurus was wrong about the universe being eternal."

As part of the analysis of the competing viewpoints, I would then want to examine the credibility of each of those who make these assertions, including examining what agendas and philosophical and religious views those experts bring to the table, to see if their conclusions appear to have been influenced by those factors. It's my experience, and I gather the experience of humanity, that very rare is the person who is totally objective and even-handed in their conclusions.

All of which leads me back to the question of how we live today and talk about our own viewpoints. My tentative formulation of the issue is to say something like "Scientists disagree but Epicurus held that the universe was eternal, this is why he held that position, and everyone should make up their own mind about what they think and how they want to apply the conclusions in their own lives.

It's my view, and I think good Epicurean theory, that our personal goal of happy living and peace of mind requires that we have a coherent understanding of the nature of the universe as natural and not subject to the whim of supernatural gods or other uncertainties that we can't evaluate and consider in our planning of our lives. Maintaining that outlook on life, while also acknowledging that new evidence is constantly coming our way and has to be incorporated into our viewpoints,. is more important that my taking a position to affirm or disagree with a particular expert whose statements contradict what I observe for myself. I am thinking that the proper approach is to politely acknowledge the disagreement and move on with my life -- always open to new evidence, of course, but not worrying that bedrock principles such as "nothing from nothing" or their logical extensions are likely to be undermined. And if someone suggestions that those bedrock principles have been undermined, or totally overthrown, I would expect clear and convincing evidence before I accepted it.

In court, to my understanding, we have an analogous issue. In cases where technical expertise is beyond the capacity of ordinary jurors, the American legal system allows lawyers to call expert witnesses to testify. Before those experts are allowed to give opinion testimony, however, they must be "qualified" to the court by the process of each side asking questions of the expert to determine their background, training, standing in the profession, and similar issues that bear on credibility. It is then the judge who decides whether the expert should be allowed to give opinion testimony, but importantly the jury is not required to believe the expert. The American legal system allows the layperson jurors to accept or reject all or part of the opinion testimony, and this is especially important to realize given what is generally the case: that both sides of an argument call their own experts, each of whom gives conflicting opinions about the ultimate question. Observing that the American trial court system operates in this way does not prove anything, but it seems to me to be a very reasonable way to proceed - to acknowledge that experts can be very helpful but should never be allowed to usurp the weighing and credibility functions of a judge or jury -- the same functions which our own minds have to perform in making the most important decisions of life.

I realize that I have spent most of this post talking about eternality, and hardly mentioned infinity in space or infinite divisibility. Epicurus considered both of these additional issues to be important to a coherent philosophy, but I won't try to extend this post by citing arguments on these issues. I'll just say that the wikipedia article on size of the universe seems to be much less helpful in supporting anyone who would say "Epicurus was wrong" on these issues. I am sure there is other and better evidence than wikipedia on these issues and we can use this or other threads to explore those questions.

All of this takes us back to questions of teamwork and cooperation and forum moderation which go along with building an Epicurean community. It causes me no concern to include in Epicurean discussions the argument that modern physics contradicts the "nothing from nothing" principle, because it's also a core Epicurean value that if there is new evidence on a subject then than new evidence needs to be incorporated into the conclusions made about that subject. I wouldn't take the position that nothing from nothing / eternal universe has to be accepted by everyone who claims to be an Epicurean, but in reverse, my view would be that the "eternal universe" theory deserves continued consideration within ongoing Epicurean discussion.

In conclusion, I wouldn't think anyone but each of us ourselves should be overly concerned with our own personal positions, so I think most of what we want to discuss as participants in this forum is a matter of "moderation" issues going forward. These issues will come up over and over so no doubt the basic positions on all sides will require constant repetition. But in terms of deciding how to describe a general attitude toward the entire subject, I am thinking that the general attitude could be summarized as something like "the evidence has been developed a lot since Epicurus' day, but that there is still a lot to be learned from Epicurus' approach and conclusions, and everyone has to decide for themselves what conclusions to accept and what

conclusions to reject."

All comments and opinions are welcome and would be helpful in sorting through these issues.

Post by “Elayne” of January 10, 2021 at 3:58 PM

I would like to reassure readers that in no way would a temporally finite universe, a universe with a beginning, have any effect on the universe being material, without supernatural realms or entities, and that it is unnecessary to adopt an infinite model just to resolve anxiety about such things. None of the current physics models include supernatural gods.

Post by “Don” of January 10, 2021 at 6:45 PM

> Quote from Elayne
>
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And, just to emphasize, Epicurus did not posit *any* responsibility for the "gods" (*however he conceived of them or we understand his conception of the* "*divine*") in the creation or administration of the cosmos. Atoms composing things and void through which the atoms can move: That's it. However the cosmos exists, it exists as a physical, material thing governed by knowable physical processes.

Post by “Don” of January 10, 2021 at 11:33 PM

Thank you, Cassius , for putting that post together. There's a LOT to unpack there. Here are some initial thoughts.

Cosmos, world, universe. The English words here obscure and obfuscate what Epicurus actually said. There's an interesting excerpt from the Letter to Pythokles:

> Quote
>
> [DL X.88]... ...A world is a circumscribed portion of the universe, which contains stars and earth and all other visible things, cut off from the infinite, and terminating [and terminating in a boundary which may be either thick or thin, a boundary whose dissolution will bring about the wreck of all within it] in an exterior which may either revolve or be at rest, and be round or triangular or of any other shape whatever. All these alternatives are possible : they are contradicted by none of the facts in this world, in which an extremity can nowhere be discerned. [89] "That there is an infinite number of such worlds can be perceived, and that such a world may arise in a world or in one of the intermundia (by which term we mean the spaces between worlds) in a tolerably empty space and not, as some maintain, in a vast space perfectly clear and void.

The "world" here is [kosmos] http://www.perseus.tufts.edu/hopper/morph?l...0:chapter=1&i=1

The "universe" is [ouranos] the "vault or firmament of heaven" http://www.perseus.tufts.edu/hopper/morph?l...r=1&i=1#lexicon

It almost seems to me that in this case, the [kosmos] is the "visible universe" and the [ouranos] is the entire universe. But it also seems like the cosmos (to use the usual English spelling of that word) is the only part of the universe that we have access to because the cosmos has " stars and earth and all other visible things, cut off from the infinite, and terminating [and terminating in a boundary...]"

Now, I'm betting that Epicurus's concept of the cosmos was the Earth surrounded by a firmament of fixed stars and moving planets in the sky/heavens/ouranos. That is *our* cosmos. But the ouranos was bigger than our cosmos and could include other cosmoi to which we may not have access. And the extent of these cosmoi -- ours plus all the rest -- were [apeiros] http://www.perseus.tufts.edu/hopper/morph?l...r=1&i=5#lexicon literally "not-limited" or boundless or infinite. According to the Pythokles letter, our cosmos *has* some kind of boundary but exists in an infinite heaven (NOTE: This has NOTHING to do with a religious "heaven"! Poetic nomenclature only for the expanse of the universe.] Our cosmos is just a piece of the infinite. So, our cosmos could be both infinite and bounded. Wrap your brain around this one: https://math.stackexchange.com/questions/8897...ite-and-bounded

I have more thoughts to come, but I wanted to end on this. I firmly believe that one must avoid equating Epicurus's atomos with our modern concept of an atom. Epicurus's point was that the atomos (and I'm purposefully using the Greek transliteration to make the point) was a finite particle of stuff that was "uncuttable". It didn't change and was also distinct from what it made up. Atomoi made up dogs, trees, and people but there were not dog-atomoi, tree-atomoi, and

people-atimoi. His primary mission in this was to contend against rival theories of his day. He wasn't trying to establish the Standard Model of quarks, gluons, mesons we have today. He'd be intrigued by this maybe, but I don't think he'd change his system. His system was adequate for his purposes. So when people slight him or try to dismiss him or try to shoehorn atomoi into the modern Standard Model, they all miss some part of the point. If you need an analog for atomoi in the modern theories, my suggestion is to think of them more as elements that make up molecules. The elements don't change whether they're in a star, a tree, or your big toe. They come together to form compounds. The elements -as building blocks - are a basic constituent of compounds. That's what Epicurus wanted to get across. There are basic building blocks in the Cosmos that can be put together in infinite ways. He posited that these building blocks were uncuttable to avoid the problem of an infinite regression. He *decided* you have to stop somewhere. That somewhere for him was the level of the atomos. You don't need to go further to account for the things in the cosmos.

Post by “Cassius” of January 11, 2021 at 7:12 AM

> Quote from Don
>
> His primary mission in this was to contend against rival theories of his day. He wasn't trying to establish the Standard Model of quarks, gluons, mesons we have today. He'd be intrigued by this maybe, but I don't think he'd change his system. His system was adequate for his purposes. So when people slight him or try to dismiss him or try to shoehorn atomoi into the modern Standard Model, they all miss some part of the point.

Yes I think this is a very key point. Most of us here are acclimated and fine with pointing out that Epicurus' "atom" was simply meant to be whatever is uncuttable, indivisible, etc., and we're not dismayed when we think about molecules, atoms, electrons, and further and further down. Epicurus wasn't concerned with the intermediate steps - he was making an ultimate logical point that at some point there "must" be something that is uncuttable and unchangeable in order to hold things together and provide the continuity that we observe. He would adjust his terminology, but probably not adjust his ultimate point against infinite indivisibility.

That's really the whole point of the argument against infinite indivisibility, and something very similar seems to me to apply to eternality and infinity as well. I think Epicurus would look at the latest observations and be intrigued by the clues it gives as to the intermediate steps, but it would not at all necessarily change his ultimate position on those points.

Obviously there are many points of his observations on lesser issues that would need to be drastically revised, at least in terms of terminology.

But to say flatly "Epicurean science was wrong. It has been superseded by modern science." Is in my view WAY overbroad. Parts have been superseded, parts have stood the test of time, as far as I can tell. But the biggest and most important assertions in the nature of things -- eternality of the universe, infinity of the universe, and the absence of infinite indivisibility - so far as I can tell do not need to be abandoned, and still stand as important parts of his system of thought.

And that is where your "adequate for his purposes" comes in. Some people don't think it's necessary to take a position on whether the universe had a beginning; whether there is an "end" to the universe in space, or whether it is possible to keep on dividing things "forever." I think we probably have more people today who are ok with that than ever before. But I don't think we should ignore people who want a "best" answer to those questions that is consistent with a non-supernatural universe and which gives them something understandable to base their thoughts on. Such a system gives them a coherent response in their minds to those who would argue that there IS no stability of any kind in the universe, and that the universe might pop out of existence at any moment just like they say it popped in. (I note that these positions serve much the same function as the initial principle doctrines, which are ultimately logical positions which are relatively easy to understand and therefore inoculate us against all sorts of damaging errors.) All I can say is that for myself I think these big picture issues are legitimate questions, and Epicurus's answers are very legitimate responses, and that they have not outlived their usefulness for literally millions of people.

So in my view there is both a "logical" and a "practical" reason to not be overbroad in characterizing Epicurean physics. We should always be clear BOTH that some aspects have been superseded, while some has not, and that the study of the entire system is worthwhile for the benefit in brings in explaining a rational perspective on the interplay between observation and having a system of thought that allows us to live successfully.

So to finish on your key sentence: " He'd be intrigued by this maybe, but I don't think he'd change his system" I know from years of discussing Epicurus on the internet that some people just go ballistic at a sentence like that. The group of people who react that way is similar to, but not the same, as those who run for the hills when they hear the word "dogmatism." I don't know any way to deal with that but to repeat over and over something like:

"*Yes, observation must always control, and that which is clearly and repeatedly observed over time must be incorporated into the system by revising the system as needed. But the fact that new observations can and will forever come in does not change our need for a system today by which to live our lives. Every one of us as we live our lives has to form judgments about what to have confidence in and what not to have confidence in. Some of the specifics of what Epicurus taught require considerable revision, but many of the major key points of the overall system which provide an understandable overview of the non-supernatural universe - such as eternality in time, infinity in space, absence of a center, absence of infinite indivisibility - still provide an intellectually viable way of seeing our place in the universe. And don't forget that error lies in*

the mind, not in observation, so the simple existence of an observation does not in and of itself give us an accurate understanding of what that observation means. It is the role of philosophy to guide us in the best rules for processing observation into a coherent system, and the perspective of Epicurus on how to apply both philosophy and observation to science is very worth of consideration even today."

Post by “Cassius” of January 11, 2021 at 7:24 AM

I'll also interject this paragaph from Lucian's "Aristotle the Oracle Monger" as I think it illustrates the interplay of theory and observation, and the need to at times hold on to the conclusions of sound theory rather than current observation, which is what I think we are ultimately talking about. I think this is showing what it is that Lucian really considered Epicurus' achievement to be, and I think Lucian is correct.

> Quote
>
> And at this point, my dear Celsus, we may, if we will be candid, make some allowance for these Paphlagonians and Pontics; the poor uneducated ‘fat-heads’ might well be taken in when they handled the serpent—a privilege conceded to all who choose—and saw in that dim light its head with the mouth that opened and shut. It was an occasion for a Democritus, nay, for an Epicurus or a Metrodorus, perhaps, a man whose intelligence was steeled against such assaults by skepticism and insight, one who, if he could not detect the precise imposture, would at any rate have been perfectly certain that, though this escaped him, the whole thing was a lie and an impossibility.

http://epicurism.info/etexts/Alexander.html

Post by “Don” of January 11, 2021 at 8:03 AM

One caveat off the top of my head: We have to be careful about calling what Epicurus and the ancient Greeks did "science." They wrote and thought about things that we would group under the heading of "science" but they weren't "doing science." They called their pursuits "physiology" (to anglicize their term) - the study of nature writ large, φύσις (physis) https://en.wikipedia.org/wiki/Physis?wprov=sfla1. They observed and thought about how the natural world works - including the whole cosmos - but calling it "science" places undue burden on their obligation to be "right." It sets up an unfair comparison where people can be smug and

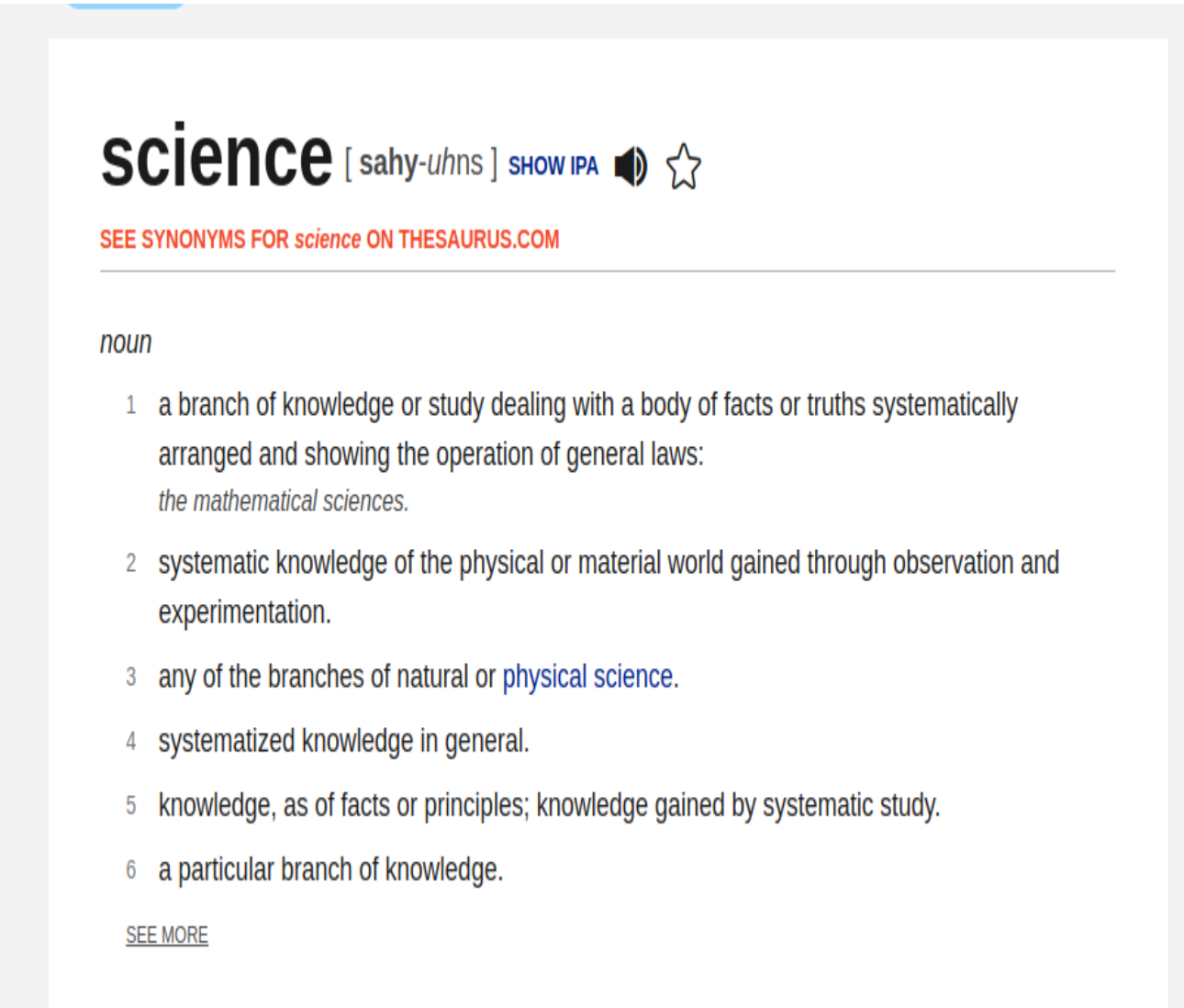
denigrate and deride how much they "got wrong." We need to look at their accomplishments in context and appreciate why they thought what they did. "Proto-science" or the precursor of science, but not "science."

Post by “Cassius” of January 11, 2021 at 9:32 AM

Don I think you make a great point -- we need to be absolutely clear about what we mean by science. And frankly in most discussions I don't think people are at all clear as to what they mean, and they include all sorts of things that are dubious in the picture when they say things like "Science says....". As far as I am concerned that is very poor phrasing, and there is no such thing as "science saying something" -- only particular scientists saying particular things. I am much more comfortable with words like "knowledge" or "wisdom" of "facts" or "truth" (such as included in the definitions below) than I am with "science." The implications and limitations of words like "knowledge" and "truth" are more familiar to us, but it seems that all someone today has to say is "science says" and they think they have won any argument. In every case I am going to want to know who are the scientists being referenced and exactly what it is they are maintaining to be true.

In fact I would go so far to say that the sentence "Science says that the universe is 14 billion years old" is about as meaningless as "Religion says that the universe is 5000 years old." I want to know the details of who is making the assertion, and on what it is based, before I would accept either assertion. The last thing we should want would be for the word "science" to become a term of intimidation by authority, like the word "religion" or the word "virtue."

I would therefore be very suspicious of a term such as philo-science, and I do think that there is a reason for thinking that there is a "scientism" issue going on in the world today as part of what we are dealing with. And I think that Epicurus dealt with exactly the same question, which is an undercurrent to what we are talking about -- he too was concerned about the limits of those who make claims based on authority of all kinds, rather than on things that we can clearly observe and consider to be established "facts."



Post by “Matt” of January 11, 2021 at 11:50 AM

My position is this...pleasure is the goal. Happiness is the goal.

Knowledge of the natural world simply dispels fears arising from ignorance and of supernaturalism, so that a person can live a life that is unperturbed by turbulent thoughts.

The infinitude of the universe, whether there are theoretical bubble multiverses, expanding and contracting models or whatever is actually out there, is ultimately not critical to my personal pleasure here on Earth. ***The specifics of it anyway***.

It may be incredibly poignant information from a scientific perspective, but from my Epicurean perspective, I only want to know that I need not fear supernaturalism and divine retribution and that the sun will not be extinguished if I don't perform certain prayers and sacrifices.

Scientific views of the universe evolve and have been evolving for hundreds of years. They will certainly evolve again as new things are discovered.

But as an Epicurean I only want to know enough to get the gist that the universe operates in a certain way , and that I need not be worried about speculative aspects of it.

Post by “Cassius” of January 11, 2021 at 11:57 AM

> Quote from Matt
>
> I only want to know that I need not fear supernaturalism and divine retribution and that the sun will not be extinguished if I don't perform certain prayers and sacrifices.

I think Epicurus might ask you: "And on what do you base your knowledge that there will be no supernatural retribution if you don't indulge in those prayers and sacrifices?"

Post by “Cassius” of January 11, 2021 at 1:07 PM

> Quote from Matt
>
> If scientists are going to unanimously start preaching pantheism and creationism etc. presumably they will come bearing significant evidence? More so than anecdotal evidence from religionists.

And this is my issue with overly-broad references to "science" and "scientists." -- Which scientists are we going to listen to, when they disagree among themselves. I seem to remember when I was younger that people were so jaded about Russian scientists speaking the party line rather than the truth that that would be an example of the type of scientist definitely not to follow. And it's really hard to achieve much by saying "reputable scientists" or "the majority of scientists" because we can all point to examples when the scientific consensus on something was wrong. And if we stick to the broadest formulation "science says..." I again think we're doing only a little more than those who say "the bible says...."

Post by “Cassius” of January 11, 2021 at 2:52 PM

Admin Note: Don asked a great question of Matt about happiness vs pleasure, and that discussion needs to continue as long as appropriate, but so as not to disrupt this thread on science and eternality etc, I clipped that out and moved it here: RE: On "Happiness" As An Abstraction / "Pleasure" As a Feeling. As for Matt's comment, let's include in this thread issues such as how do you ***know*** that there is no supernatural retribution or reward?

Post by “Godfrey” of January 11, 2021 at 3:01 PM

Playing catch-up and digressing to post #4:

> Quote from Don
>
> Our cosmos is just a piece of the infinite. So, our cosmos could be both infinite and bounded. Wrap your brain around this one: https://math.stackexchange.com/questions/8897…ite-and-bounded

Infinite and bounded, I think, can only be a mathematical abstraction. In my understanding, in order to get an infinite number of atoms (or anything else) into a bounded space you would need infinite divisibility, which Epicurus discounted. Looking at the 0-1 examples in the link, the way they achieve infinity is through infinite divisibility. Epicurus may have been saying that infinite divisibility exists only in the abstract but physically is an absurdity.

Post by “Don” of January 11, 2021 at 3:43 PM

> Quote
>
> This is why we say that pleasure is the beginning and the end of a completely happy life. καὶ διὰ τοῦτο τὴν ἡδονὴν ἀρχὴν καὶ τέλος λέγομεν εἶναι τοῦ μακαρίως ζῆν.

Happiness is such a vague concept even among positive psychology researchers. Like the proverbial obscenity: "I know it when I see it." It's used to translate any number of words in the

original texts, sometimes it seems arbitrarily. Here it's the same word from PD1 translated "blessed" there.

Post by “Elayne” of January 11, 2021 at 4:09 PM

On atoms meaning elements-- of course, elements are made of atoms (in current usage), not molecules. Maybe I am misunderstanding the suggestion though. Modern atoms would not fit Epicurus' atoms better than elementary particles, because they aren't just "cuttable"-- they can change into each other through radioactive decay. For instance, the decay of uranium to lead is used for dating materials. I think that aspect makes atomic elements unsuitable as a parallel, and elementary particles are closer, being actually uncuttable so far as we can tell.

However, I also think it's legit not to stretch Epicurus' ideas to fit modern ones, even when there are similarities.

In Cassius' comments, there is the suggestion that other models of the universe might scare people into thinking things might suddenly spring into existence today. That is not part of any seriously considered cosmology model I have seen. It is a mistake IMO to imply that these other models should or might provoke anxiety, especially because one of them may turn out to be correct. People _will_ encounter these ideas, unless they just don't read much. Rather than put them in the position of thinking there's anything unnerving about these models, we can reassure them there's still nothing to worry about.

The more important thing to say is that none of them change the conclusions of the philosophy. The ethics conclusions of EP do not rest on infinity, eternity, or indivisibility, and they won't be unraveled if any of those things is found inaccurate.They rest on materiality, and none of the major theories challenge that. So no need to defend one materialist model out of fear a different one will damage EP. It won't happen.

Fundamentally what I mean when I say science is observations which inform models, followed by more observations, with revisions and replacements of models as required to include all the replicable observations. There are specific methods in science, making predictions to test hypotheses and so on, and ways we have learned to avoid confusing ourselves with confounding variables. But ultimately science is observations in the driver seat. Not letting abstract models drive the bus but always going back repeatedly to the study of nature.

Science is not fundamentally a process of reasoning. Reasoning is a tool, yes, but observations rule. That was one of the things that attracted me to EP. When I notice people clinging to a chain of reasoning, I notice they become resistant to new observations.

That is the way the scientists I grew up with approached reality. So when I hear people questioning whether science is "all that" or if we should consider some other process better when it comes to understanding the nature of things-- I think, what process is more accurate than observations driving models? Certainly not reason!!

We even do this with feelings-- we observe what actions and conditions lead to pain or pleasure and thus become increasingly skilled at planning accurately for pleasure. We engage in an individual scientific study of our own pleasure.

Post by “Elayne” of January 11, 2021 at 4:27 PM

And on the issue of credibility of specific scientists-- data replicated by multiple independent researchers has historically had the most reliability. So that is one way you can assess. Note that I am not saying multiple people making the same conclusions about one set of data, consensus. Consensus is not a real level of evidence. Independent replication, though, especially with different instruments, increases the chances of reliable observations.

When a person is not sure, perhaps because the subject in question is not in their field of expertise, reverting to reason instead of evidence is not likely to lead that person in an accurate direction. Reason is full of pitfalls, mainly hidden in faulty premises-- hidden until new observations help us see more of what is going on.

To use an extreme analogy, suppose someone doesn't trust explanations and evidence about the earth being roundish and thus says "I don't know which scientists to trust, so I'm going with the earth being flat. It looks flat to me." That person is going to make navigation errors. And of course, there are people out there like that!

In my medical career, I have seen reason lead to significant errors in standard practice, only undone finally by evidence. And I've seen how hard it is to get people to change when reasoning has gotten ahold of them. This has made me very stubborn on the issue of careful observations and wariness with chains of reason, if any part of the chain is not tested with observations.

Post by “Don” of January 11, 2021 at 10:40 PM

> Quote from Elayne

> On atoms meaning elements-- of course, elements are made of atoms (in current usage), not molecules. Maybe I am misunderstanding the suggestion though. Modern atoms would not fit Epicurus' atoms better than elementary particles, because they aren't just "cuttable"-- they can change into each other through radioactive decay.

Modern atoms would not - do not - fit the concept of ancient atoms. That's exactly my point. I'm sure Epicurus didn't know about radioactive decay, so I'll side step that.

Epicurus's and Lucretius's atoms/seeds/particles are fundamental building blocks of the cosmos in their system. They come together in novel ways to make everything. The seeds remain unchanged. My suggestion is that it's easier to think about their "Atomoi" more like our "elements" - carbon "atoms", hydrogen "atoms". I know our atoms are cuttable. (At one point, we didn't think they were but right now that's beside the point I'm trying to make). Leaving aside the cuttability for a moment, Epicurus's "Atomoi" came together in various configurations for a time, composed a compound, then came apart to go form another compound somewhere else. Our modern atoms of elements do this - at a very basic level of popular understanding. The carbon atom in a pencil is the same carbon atom in a diamond. The element atom doesn't change. Likewise, our atoms take on chemical bonds, some stronger, some weaker. I liken this to Lucretius's description of hooked and smooth "seeds". No, there aren't hooked and smooth atoms in our understanding now, but some bonds are stronger than others. They get "entangled" to use an ancient way of thinking: liked a box of fishhooks (or Christmas tree ornament hooks!). Smooth marbles don't become entangled, so - to Epicurus or Lucretius - marbles are like water "Atomoi". Granite is a stronger bond and harder to break apart. That's like the fishhooks being harder to break apart.

I'm trying to make an analogy between the ancient and modern ideas, not to equate one concept with another. That's all.

Post by “Elayne” of January 12, 2021 at 12:20 AM

But elements _are_ the same thing as modern atoms. There are carbon atoms. Hydrogen atoms-- not "atoms" but actually atoms. I think by the quotation marks you used, you are thinking that's metaphorical, but it isn't. I don't get why you wouldn't make an analogy between ancient atoms and modern atoms but you would for ancient atoms and modern elements which are the exact same thing as modern atoms. Or are you saying something else and I'm being dense, lol?

This issue with atoms combining to make molecules happens also with the elementary particles, which are the building blocks for the parts of atoms and thus both atoms and

ultimately molecules. That makes them just as reasonable a candidate for analogy, plus they have the indivisibility (we think).

Post by “Joshua” of January 13, 2021 at 4:04 PM

> Quote
>
> Most ordinary people have training in astrophysics

□□ Either you've slipped up, Cassius, or you meet with a different vintage of 'ordinary' than I do!

Post by “Cassius” of January 13, 2021 at 5:56 PM

Once again my negligent typing rears its head. Thank you Joshua! I will correct the original but leave these comments to document your assistance!