Question Re Thermodynamics And Deductive Reasoning v. Empiricism

Post by “Cassius” of October 3, 2019 at 8:13 AM

Poster:

What is the Epicurean position on 2. law of thermodynamics in relation to their presupposition of eternal universe? These two things appear to be mutually exclusive to my mind. The 2. law is observable by senses and was probably even obvious from the direct observation to a cave man. The eternal universe however is not something we can observe even with the aid of most sophisticated technology.

Post by “Cassius” of October 3, 2019 at 8:13 AM

I will be interested in what others have to say about this, especially Martin Huehne, but I think the key aspect of your question is contained in "is not something we can observe even with the aid of the most sophisticated technology."

The point to remember here is that Epicurus was not a "radical" empiricist who insisted on direct observation of every aspect of his philosophy. This is a point developed at length by DeWitt, but not often by others, that it is obvious that Epicurus embraced deductive reasoning, with the starting point being sensation, but by no means limited to what can be perceived directly.

This is obvious even from the beginning of the discussion of atoms and void - Epicurus certainly did not have the technology to observe atoms directly, and void is by its nature empty of details to sense, and atoms and void they are at the core of his philosophy due to his deductive reasoning that they must exist based on what he *was* able to observe. This observation applies both to the existence of the atoms as well as to the conclusion that the universe is eternal, which is based on the observation and reasoning that matter is not created or destroyed spontaneously (or, as specified in Lucretius, at the will of gods).

Here are a couple of quotes where we can observe this deductive reasoning most clearly:

From the letter to Herodotus, note the sentence I have placed in ALL CAPS:

"First of all, that nothing is created out of that which does not exist: for if it were, everything would be created out of everything with no need of seeds. And again, if that which disappears were destroyed into that which did not exist, all things would have perished, since that into which they were dissolved would not exist. Furthermore, the universe always was such as it is now, and always will be the same. For there is nothing into which it changes: for outside the universe there is nothing which could come into it and bring about the change. Moreover, the universe is bodies and space: FOR THAT BODIES EXIST, SENSE ITSELF WITNESSES IN THE EXPERIENCE OF ALL MEN, AND IN ACCORD WITH THE EVIDENCE OF SENSE WE MUST OF NECESSITY JUDGE OF THE IMPERCEPTIBLE BY REASONING, as I have already said. And if there were not that which we term void and place and intangible existence, bodies would have nowhere to exist and nothing through which to move, as they are seen to move. And besides these two, nothing can even be thought of either by conception or on the analogy of things conceivable such as could be grasped as whole existences and not spoken of as the accidents or properties of such existences.

Lucretius Book 1 Bailey:

[420] But now, to weave again at the web, which is the task of my discourse, all nature then, as it is of itself, is built of these two things: for there are bodies and the void, in which they are placed and where they move hither and thither. For that body exists is declared by the feeling which all share alike; AND UNLESS FAITH IN THIS FEELING BE FIRMLY GROUNDED AND ONCE AND PREVAIL, THERE WILL BE NAUGHT TO WHICH WE CAN MAKE AN APPEAL ABOUT THINGS HIDDEN, SO AS TO PROVE AUGHT BY THE REASONING OF THE MIND. And next, were there not room and empty space, which we call void, nowhere could bodies be placed, nor could they wander at all hither and thither in any direction; and this I have above shown to you but a little while before.

Post by “Cassius” of October 3, 2019 at 8:51 AM

Poster:

Isn't that an argument from ignorance which is usually employed by various religious systems? My question is related to his method - since he employed that argument against both sceptics and the religious of his days. If we presuppose various models without any confirmation in the observable we can also presuppose that any of these presupposed models rest upon the giant turtle - or a god of any variety.

Post by “Cassius” of October 3, 2019 at 8:52 AM

It is an observation that the senses are all we have to work with, and that our choice is either to use them intelligently or essentially despair and go live in a cave and die. You are stating a huge epistemology issue that we ought to develop and be very clear about. Because there are certain things that are outside our power to observe, do we then sit down and cry and say that "anything goes"? Or do we with confidence embrace the tools that we have and use them to the best of our ability?

Much time is spent on this issue in Book 4 of Lucretius as it is basically the same issues as the "illusion" question. We know that we are imperfect and that the senses can provide perceptions that are at times distorted. Do we then throw up our hands to imaginary gods to save us from our weakness? No!

That's what is being discussed in this passage from Lucretius Book 4:

"The sun, to Mariners, seems to rise out of the sea, and there again to set and hide his light; for they see nothing but the water and the sky; but therefore you are not to conclude rashly that the senses are at all deceived.

To those who know nothing of the sea, a ship in the port seems disabled, and to strive against the waves with broken oars; for that part of the oar and of the rudder that is above the water appears straight, but all below, being refracted, seems to be turned upwards, and to be bent towards the top of the water, and to float almost upon the surface of it.

So when the winds drive the light clouds along the sky in the night, t he moon and stars seem to fly against the clouds, and to be driven above them in a course quite opposite to that in which they naturally move.

And if you chance to press with your fingers under one of your eyes, the effect will be that every thing you look upon will appear double, every bright candle will burn with two flames, and all the furniture of the house will multiply and show double; every face about you, and every body, will look like two.

Lastly, when sleep has bound our limbs in sweet repose, and all the body lies dissolved in rest, we think ourselves awake; our members move, and in the gloomy darkness of the night we think we see the sun in broad day-light, and, though confined in bed, we wander over the heavens, the sea, the rivers, and the hills, and fancy we are walking through the plains. And sounds we seem to hear; and, though the tongue be still, we seem to speak, when the deep silence of night reigns all about us.

Many more things of this kind we observe and wonder at, which attempt to overthrow the certainty of our senses, but to no purpose - for things of this sort generally deceive us upon account of the judgment of the mind which we apply to them, and so we conclude we see things which we really do not; for nothing is more difficult than to distinguish things clear and plain from such as are doubtful, to which the mind is ready to add its assent, as it is inclined to

believe everything imparted by the senses.

Lastly, if anyone thinks that he knows nothing, he cannot be sure that he knows this, when he confesses that he knows nothing at all. I shall avoid disputing with such a trifler, who perverts all things, and like a tumbler with his head prone to the earth, can go no otherwise than backwards.

And yet allow that he knows this, I would ask (since he had nothing before to lead him into such a knowledge) whence he had the notion what it was to know, or not to know; what it was that gave him an idea of Truth or Falsehood, and what taught him to distinguish between doubt and certainty?

But you will find that knowledge of truth is originally derived from the senses, nor can the senses be contradicted, for whatever is able by the evidence of an opposite truth to convince the senses of falsehood, must be something of greater certainty than they. But what can deserve greater credit than the senses require from us? Will reason, derived from erring sense, claim the privilege to contradict it? Reason – that depends wholly upon the senses,which unless you allow to be true, all reason must be false. Can the ears correct the eyes? Or the touch the ears? Or will taste confute the touch? Or shall the nose or eyes convince the rest? This, I think, cannot be, for every sense has a separate faculty of its own, each has its distinct powers; and therefore an object, soft or hard, hot or cold, must necessarily be distinguished as soft or hard, hot or cold, by one sense separately, that is, the touch. It is the sole province of another, the sight, to perceive the colors of things, and the several properties that belong to them. The taste has a distinct office. Odors particularly affect the smell, and sound the ears. And therefore it cannot be that one sense should correct another, nor can the same sense correct itself, since an equal credit ought to be given to each; and therefore whatever the senses at any time discover to us must be certain.

And though reason is not able to assign a cause why an object that is really four-square when near, should appear round when seen at a distance; yet, if we cannot explain this difficulty, it is better to give any solution, even a false one, than to deliver up all Certainty out of our power, to break in upon our first principle of belief, and tear up all foundations upon which our life and security depend. For not only all reason must be overthrown, but life itself must be immediately extinguished, unless you give credit to your senses. These direct you to fly from a precipice and other evils of this sort which are to be avoided, and to pursue what tends to your security. All therefore is nothing more than an empty parade of words that can be offered against the certainty of sense.

Lastly, as in a building, if the principle rule of the artificer be not true, if his line be not exact, or his level bear in to the least to either side, every thing must needs be wrong and crooked, the whole fabric must be ill-shaped, declining, hanging over, leaning and irregular, so that some parts will seem ready to fall and tumble down, because the whole was at first disordered by false principles. So the reason of things must of necessity be wrong and false which is founded upon a false representation of the senses."

Post by “Godfrey” of October 3, 2019 at 2:10 PM

Entropy is an interesting topic, and one that I as a non scientist ponder from time to time. Also the question: how can order arise from chaos? To this it seems that the answer is bit by bit, over eons: evolution. Does anybody here know of writings that address these topics in a manner comprehensible to a layman?

Random thought: current physics seems to be mostly based on reasoning, predominantly mathematical. These reasonings begin with observations of the physical world, but at what point do they become detached from the observable and enter the realm of pure speculation? However without this speculation there is no progress.

Post by “Todd” of October 3, 2019 at 3:16 PM

I think it is important to acknowledge that there are things we just don't know.

Epicurus taught that the only good reason to acquire knowledge was if it increased our pleasure.

On the other hand, he also engaged in reasoning about the nature of the universe, for which, in retrospect, he really didn't have adequate data. I don't think this was an inconsistency. It was a practical matter that needed to be addressed: ignorance was a source of distress, so he needed to say something on the subject, and he reasoned it out as best he could. He did remarkably well with the data available to him.

It's a mistake to think we have to defend Epicurean physics when modern science seems to disagree about the details. It's important for us to understand Epicurean physics, not because we believe it to be a completely accurate description of reality, but in order to understand the basis for Epicurean ethics. I'm not aware of any scientific discoveries that would overthrow Epicurean ethics - much the contrary.

Edit:

Regarding ignorance being a source of distress, that is not to mention the nonsense on stilts coming from the Academy, which was probably an even more important motivation.

Post by “Martin” of October 4, 2019 at 11:11 AM

Here is my slightly adapted comment from the thread on FB:

Essentially, I agree with Cassius' comments.

1. It does not matter for the philosophy whether Epicurus' postulate of an eternal universe is false if taken literally.

From ancient times until about 1920, models postulating an eternal universe were compatible with the evidence, although the universe would eventually become void of life because of the 2nd law of thermodynamics.

Epicurus' eternal universe avoided a lot of questions to which only speculative answers could have been given.

Einstein himself constructed a model for a stable, on large scales homogeneous universe, which could be eternal. But soon after, new evidence ruled out his stable universe.

Using those of the current models which are best supported by evidence (which excludes multiverse(s) for now), the universe started from something close to the big bang and before that, time did not exist either. The universe will expand into eternity but it seems there is no way around the extinction of all lifeforms.

2. There are some possibilities to interpret Epicurus' eternal universe in a way that it still holds if not taken literally. E.g. the universe has already been in existence far longer than mankind and is likely to still exist for much longer than us who are currently alife. So, postulating an eternal universe is a fairly accurate approximation as far as our pleasure is concerned.

3. Cosmology seems to stand out from other branches of physics in a unique way: Acceptable physical models in the other branches usually have no contradictions in themselves and do not contradict basic physical principles within their range of applicability. But so far, there is no cosmological model without fundamental contradictions in the physics.

4. Even the most rudimentary type of philosophy with the least assumptions, scientism, still does make assumptions to become in any way useful.

EP goes way beyond scientism and therefore makes more assumptions. Although EP is based on physics, it does not follow conclusively from empirically tested physics.

We here support EP because we perceive it as the most convincing philosophy, in particular because it does not resort to the supernatural and because it is useful for planning and living our lifes.

Post by “Martin” of October 4, 2019 at 11:41 AM

Godfrey:

I do not have a simple reference but maybe my approach helps: The analogy between chaos and entropy was an obstacle to my understanding of entropy during my study. When ignoring that analogy and instead concentrating on the definition, which means that entropy is a measure of the probabilty to observe a particular combination of the states of many particles in a system , we should expect that the development with time goes toward combinations with higher probability, that is higher entropy.

In a system consisting of 2 sub-systems, it should be possible to get a decrease in entropy of one sub-system if the entropy in the other sub-system increases at least as much as the entropy in the first one has decreased.

To make sense out of empirical data, scientists build a model because observations without a model hardly lead to any understanding and there is no justification to extrapolate the data or to trust their reproducibility without a model.

The model gets tested with more empirical data, preferably from systematic experiments designed to refute the model.

If a model passes the tests and there is no better model at hand, this model eventually becomes part of scientific knowledge but might later on be refuted (or more often just abandoned) when contradicting data or a better model are found.

Speculation comes in if models have no strong empirical base and are not tested or are possibly not even testable, e.g. string theory or the multiverse as of now.

Post by “Joshua” of October 4, 2019 at 1:27 PM

It seems to me that the chief problem is not with entropy itself but with inflation. If the rate of expansion were declining we could reasonably expect a reversal, followed by a collapse back into singularity. In theory this process could be cyclical. But what we seem to know about the rate of expansion is that it is accelerating.

In a hundred years our conception of physics might be as unrecognizable to us now as our models now would be to those living a century ago. For the practical student of philosophy, the ends remain unchanged. There continues to be no good evidence for the miraculous. The explanatory power of a hypothetical 'god' continues to be, as Neil DeGrasse Tyson put it, "an

ever-receding pocket of scientific ignorance". And the stage is *still* too big for the drama.

Post by “Cassius” of October 4, 2019 at 1:32 PM

THIS is my position too:

> Quote from JJElbert
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> In a hundred years our conception of physics might be as unrecognizable to us now as our models now would be to those living a century ago. For the practical student of philosophy, the ends remain unchanged. There continues to be no good evidence for the miraculous. The explanatory power of a hypothetical 'god' continues to be, as Neil DeGrasse Tyson put it, "an ever-receding pocket of scientific ignorance". And the stage is still too big for the drama.

Any of us could put down what we are doing, devote every waking moment to studying and pursuing the latest in physics, but I think we can say with confidence that at the end of that time we would still find questions to pursue which cannot be answered. We'd know a lot more, but have an entirely different set of questions.

And we can with certainty state that we'll still face the argument "How can I know FOR SURE? I wasn't there to see it myself!"

So we will always face a question of "evidence' as to what we choose to accept as "final" for us, and what we choose to reject or hold open. And if that is the case, it makes sense right at the start to recognize the limits of how much knowledge we will ever accumulate, and instead of pouring every waking moment into physics books, think about the big picture of what we DO know, what we can practically do with our limited knowledge, and what kind and amount of evidence we are going to accept, given that we will never obtain "god-like certainty" or even "I was there" certainty about the answer.

Post by “Eikadistes” of October 4, 2019 at 2:03 PM

Part of nature is knowing our limitations. Epicurus wasn't *omnipotent*, and such a concept is abominable to us. Recognition of humbleness, of curiosity, of our continued commitment to

explore, to learn, to grow, and prosper is as natural as anything. We're not here to provide an answer to the ultimate questions of speculative metaphysics. We're here to learn, and that means challenging ourselves, revising our mistakes, and persisting in our search, **even when** the inevitable acknowledgment of our smallness and ignorance leads us to despair. As Merlin says in "The Once and Future King":

"'*The best thing for being sad,' replied Merlin, beginning to puff and blow, 'is to learn something. That's the only thing that never fails. You may grow old and trembling in your anatomies, you may lie awake at night listening to the disorder of your veins, you may miss your only love, you may see the world about you devastated by evil lunatics, or know your honour trampled in the sewers of baser minds. There is only one thing for it then – to learn. Learn why the world wags and what wags it. That is the only thing which the mind can never exhaust, never alienate, never be tortured by, never fear or distrust, and never dream of regretting. Learning is the only thing for you. Look what a lot of things there are to learn.*'"

Our pursuit is **pleasure** – raw, unadulterated, invaluable pleasure. I say: leave the exactitude of "*infinity*" to the mathematicians. While they juggle with abstractions, we tan in the sun, and sip a cool drink with a friend.

Post by “Godfrey” of October 4, 2019 at 2:06 PM

Martin, thanks for your comments, especially regarding entropy. Joshua that's a good point about inflation/expansion.

The reason that I find these ideas of interest is that I think that EP has a strong enough basis in reality that grappling with them from time to time serves, at least generally, to bridge the 2000 year gap. As opposed to some ancient philosophies that crumble when exposed to current thinking.

From time to time I find great pleasure thinking about these ideas, while suspended on my hammock and swatting the occasional mosquito 🤔

Post by “Cassius” of October 4, 2019 at 5:13 PM

Nate I remember reading the Once and Future King a long time ago - it was great! I need to revisit it.

The quote you listed on the face of it could read the wrong way - some kind of Platonic idea that "wisdom" is the goal of life, but I don't think the quote can be read without realizing the FEELING behind it, so it is kind of ironic but that in stating that somehow "learning" is the goal, he is saying that learning brings "the remedy for being sad" which is pleasure!

And yes Godfrey I agree too that reading the physics helps bridge the time gap and reminds us than no matter what the year on the calender we are all pretty much the same in basic nature and questioning.