

Connecting Thought With Atoms - Emergence, Downward Causation (From The Macroscopic To The Atomic), and Epicurus

Post by "Cassius" of March 29, 2026 at 3:22 PM

In [today's Zoom](#) and also podcast this issue was discussed as a result of [David Sedley's article "Epicurean Anti-Reductionism."](#) The basic concept as I understand it it likely this:

Epicurus would have understood just as we do today that it is not intuitive how atoms, which have no properties other than shape, size, and weight, can no matter how they combine have the ability to think and assume all the other complex phenomena that we see around us. In even simpler terms, how can atoms which do not possess the property of color combine into bodies that do have the property of color. Has something been added to the body that was not present in the originating atoms?

It is one thing to say that these phenomena "emerge" from the atoms, and another to offer any kind of coherent and persuasive conceptual model of how this might be possible. And note that I say "model" rather than "explanation," as "explanation might imply we can somehow list what might be an infinite series of causes.

In "Epicurean Anti-Reductionism" Sedley builds the Epicurean case for providing an explanation how this could occur, and he gives citations to where the phenomena is discussed in the texts, including Lucretius in Book 2 discussing how the mind of a horse issues orders for the horse to emerge onto the racetrack.

This also has obvious relevance for issues of determinism.

This is a very interesting area to develop and it continues to be a matter of discussion today, often under the name of "downward causation."

Here's a clip from Sedley's article and after that I will post a number of resources. I have not read them other than to glance at the first, which came from Joshua:

But is there also downward causation? Can the properties of a macroscopic body act causally on its atomic components? It may be hard at first to see how they could. For example, if a macroscopic object is sufficiently dense it falls to the bottom when dropped in water. It is sound Epicureanism to conclude that the object's density is the cause of *its* falling. But there seem to be no grounds for adding that the object's density is also the reason why each atom in it, taken individually, falls. At the atomic level, each atom's behaviour is accountable in terms of its own weight, perhaps the occasional random swerve, and its collisions with other atoms. Thus one might conclude that in Epicureanism all causation is either upward (from the atomic to the macroscopic) or horizontal (from the atomic to the atomic, or from the macroscopic to the macroscopic).

causes will be found at the atomic level. When the water in a kettle changes to steam, the immediate cause may be an accidental property, its becoming hot; but that accident, although it has no existence at the microscopic level, is nevertheless caused by a set of underlying atomic changes. In short, if an Epicurean world lacks downward causation, all macroscopic properties are mechanically caused by the motions of atoms.

Was Epicurus willing to stomach this conclusion? Emphatically, no. That even human behaviour should be mechanically determined was an unacceptable outcome of Democritean atomism which Epicurus, famously, felt able to resist⁸⁶. Moreover, his denial of it involves an express assertion of downward causation. Lucretius, on Epicurus' behalf, assures us that the cause of autonomous action must be the mind's volition, and that the *corpsa materialia*⁸⁷ in the limbs is directed by this volition (ll 251-83, especially 261-2, 266-71, 278-93). Now the "mind" is itself the physical organ of consciousness⁸⁸, comparable to the brain and nervous system in modern physiology. But "the mind's volition" (its *voluntas*, 257, 261, 270, 276; its *studium*, 268) can only be an accidental property of that organ. It therefore follows from everything we have learnt so far that volition exists only at the level of experience, not at the atomic level. Yet volition is said to act upon our atomic matter.

[Examples of downward causation? — The Brains Blog](#)

I just culled together a bunch of putative examples of downward causation, some from advocates, some from detractors. Particularly interesting and promising is...
philosophyofbrains.com

(There are many more references I will add as time allows.)

Crossreference to [the Zoom where this arose](#).