

Atomisms, old and new

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Ancient Atomism

We'll take Epicurus as our exemplar.

Other notable ancient atomists:

Leucippus (first we really know about)

Democritus (student of Leucippus)

Lucretius (mostly famous because his writing survived, but he's mostly just summarizing Epicurean philosophy)

Basic thesis of Atomism: ordinary physical matter has smallest bits – atoms.

Contrasts:

- ordinary physical matter is infinitely divisible (Descartes)
- ordinary physical matter is composed of form and *prime* matter (\neq ordinary physical matter) (Aristotle, medieval Scholastics)

Atoms are:

- Indivisible
- Indestructible
- Unalterable (in their intrinsic properties, not their relational properties)
- Ancient atomists also accepted the existence of void, or empty space
 - On this picture, physical reality consists entirely of atoms in the void.
- Ordinary objects are aggregations of atoms.

Epicurus:

...the whole of being consists of bodies and space. For the existence of bodies is everywhere attested by sense itself... And if there were no space (which we call also void and intangible nature), bodies would have nothing in which to be and through which to move, as they are plainly seen to move. Beyond bodies and space there is nothing which by mental apprehension or its analogy we can conceive to exist. When we speak of bodies and space, both are regarded as wholes or separate things, not as the properties or accidents of separate things.' (22-3)

So, atoms are the basic/ simple: not forms, not prime matter, not properties – atoms.

Why believe any of that?

To avoid possibility of things popping into existence ex nihilo

Epicurus again:

...nothing comes into being out of what is non-existent. For in that case anything would have arisen out of anything, standing as it would in no need of its proper germs. And if that which disappears had been destroyed and become nonexistent, everything would have perished, that into which the things were dissolved being nonexistent. Moreover, the sum total of things was always such as it is now, and such it will ever remain. For there is nothing into which it can change. For outside the sum of things there is nothing which could enter into it and bring about change.

This is an argument for the 'no creation ex nihilo' principle

Creation ex nihilo is unconstrained (there's nihilo to constrain it)

So a world created ex nihilo would be utterly random

The world isn't random

So, the world (and it's parts) aren't created ex nihilo

NB: this is very similar to Aristotle's motivation for hylomorphism

recall: Aristotle's motivation is to understand change

Not just any change: substantial change

Substantial change involves the creation or destruction of a substance

Aristotle thought there are most basic types of substances (earth, water, wind, fire, ether)

Those basic substances can change from one type to another

To avoid analyzing this as the annihilation of one substance and the creation ex nihilo of another, he posits something more basic: form and prime matter

The form constrains the nature of the resulting substance

The nature of atoms allows Epicurus to avoid that conclusion.

...[atoms are] indivisible and unchangeable, and necessarily so, if things are not all to be destroyed and pass into non-existence, but are to be strong enough to endure when the composite bodies are broken up, because they possess a solid nature and are incapable of being anywhere or anyhow dissolved. It follows that the first beginnings must be indivisible, corporeal entities. (23)

In other words, the properties of atoms never change.

Since they never change, no need for a story about something more basic that persists through the change

Epicurus was a materialist:

- Everything that exists is made of physical matter
- Since all matter is made of atoms, everything is made of atoms
- This includes the mind/ soul
- Special 'soul atoms' distributed throughout the body
- Soul atoms responsible for thought and sensation
- Soul atoms don't survive the death/ decomposition of the rest of the body
- So, no life after death

This is really important: best known as an advocate of living well, seeking pleasure

Partial motivation: no reward/ punishment in the afterlife (there isn't one), so live it up

Boyle's 'Corpuscular' philosophy

Boyle adopts parts of the ancient atomist's theory, rejects other

Rebrands it as 'Corpuscularianism'

Differences with ancient atomists: Agnostic on whether there really are smallest bits of matter (i.e. atoms) or whether matter is infinitely divisible. Agnostic on whether the void exists (if matter is infinitely divisible, space might be full, i.e. a plenum)

'2 grand an most catholic principles':

1. There only one type of matter - corpuscles (nay, atoms) - with essential properties: Size, Shape, Motion or rest
2. All macroscopic objects are combinations of this matter; diversity of macro objects the result of local motion of corpuscles

Mechanism: Not just different types of substances explained by motion: also all change/ interaction of objects

Watch example: a single spring causes many effects

Consequence: observable qualities of objects (colors, tastes, etc) aren't properties of corpuscles: they emerge from collections of corpuscles

In a sense, they're not really in the object at all (more later)

Political problem: Atomism is associated with Epicurus, materialism, atheism

Solution:

not everything is made of corpuscles, just all material bodies

Minds/ souls aren't material

Local motion of corpuscles of earlier times explains local motion or corpuscles at later times. How did those local motions start?

Epicurus: motion is an essential property of atoms (so nothing to explain)

Boyle: God set corpuscles in motion, determined that they move so as to determine certain features of the world: clumped together to form animals, etc