The History of Philosophy

Plato vs. the atomists
Plato’s Cave

- To explain what happens to a student who begins to study philosophy (e.g. science) Plato tells a story about people initially trapped in a dark cave, seeing only shadows of objects.
• Then someone gets out, and sees real objects, clearly, under the light of the sun.
Philosophy is hard ...

“At first, when any of them is liberated and compelled suddenly to stand up and turn his neck round and walk and look towards the light, he will suffer sharp pains; the glare will distress him, and he will be unable to see the realities of which in his former state he had seen the shadows.”

“And suppose once more, that he is reluctantly dragged up a steep and rugged ascent, and held fast until he's forced into the presence of the sun himself, is he not likely to be pained and irritated?”
Real vs. Apparent

• Science often tells us that the way the world seems to us is incomplete, and partly an illusion. Most of what’s going on is hidden from our senses.

• E.g. while the motion of Mars appears complicated and rather arbitrary to the eyes, Kepler’s mind saw perfect elliptical motions.
Plato’s Forms

• The four objects below are quite different from each other, in size and colour. But do you see anything that is the same in them all?
Clearly, says Plato, there is some single “thing” that is “in” all of the objects. That is the Form *Square*.

- *Square* is not a material object.
- *Square* is not just an idea in our minds (why not?) but it’s perceived by the mind. It’s not visible.
- *Square* is permanent, unchanging, indestructible. So it’s more real than a material object.
• N.B. one of the words usually translated “Form” here is ἴδεα in Greek, from which our word *idea* is derived. So sometimes the word “Idea” is used instead of “Form”.

(But, as we have seen, a Form is not something that exists in our minds. Rather, it’s accessible to the mind.)
The Form of the Good

- Plato held that one form, the Form of the Good, is superior to the others. Somehow, it gives existence to all the other Forms.

“... in the world of knowledge the idea [Form] of good appears last of all, and is seen only with an effort; and, when seen, is also inferred to be the universal author of all things beautiful and right, parent of light and of the lord of light in this visible world [i.e. parent of the sun], and the immediate source of reason and truth in the intellectual ...”
• It is no surprise that (centuries later) Christian philosophers such as Augustine saw Plato’s Form of the Good as a glimpse of God. From there, it is natural to interpret the other Forms as God’s ideas, or God’s concepts. (This is called Neoplatonism.)

• This notion even persists into modern philosophy. Leibniz (1646 – 1716) for example believes that in creating the world God began by considering all the possible worlds, as mere abstract ideas in his mind, and then giving substance to the one he liked best.
Essentialism

• Plato’s theory of Forms is an example of *essentialism*, the view that each kind of object has a certain property (or some properties) that are essential to making it an object of that kind.
• For example, what features does an object need to have, in order to be a dog?
• An individual dog has extra (non-essential) attributes, in addition to its doggy essence, says Plato.
Essentialism in Chemistry

• Essentialism works pretty well in Chemistry.

• For example, what is the essence of water? Is there some property that makes a thing water?

• Yes, water is $\text{H}_2\text{O}$. 
Essentialism in Philosophy

• Plato applied this idea of essences to philosophical questions, e.g.
  • What is justice?
  • What is virtue?
  • What is knowledge?

• In the case of knowledge, for example, we require not just a list of kinds of knowledge (from perception, memory, reasoning, ...) but an understanding of what it is that makes some belief a case of knowledge.
Essentialism in biology

• Essentialism doesn’t fit well with evolutionary biology. (Ernst Mayr made this point especially.)

• If a dog-like animal evolves to become a dolphin, for example, at what exact point is the doggy essence lost, and the dolphin essence acquired?
“Natural Kinds”

• Philosophers today don’t believe in Plato’s forms, for the most part, but we do talk of natural kinds. These are groups or classifications that are somehow “real”, or inherent in the objects themselves, not made up by humans.

• E.g. gold, tiger, etc. (i.e. scientific categories)

• But the natural kinds wouldn’t exist without the physical objects, would they?
Platonism is apparently supported by the fact that the world seems to be built upon mathematical (or rational) principles.
“The miracle of the appropriateness of the language of mathematics for the formulation of the laws of physics is a wonderful gift which we neither understand nor deserve.”

(Physicist Eugene Wigner)
“Arithmetic must be discovered in just the same sense in which Columbus discovered the West Indies, and we no more create numbers than he created the Indians.”

**Bertrand Russell,** *The Principles of Mathematics* (1903), 451
“God used beautiful mathematics in creating the world.”

Paul A. M. Dirac (Quoted in Behram Kursunoglu and Eugene Paul Wigner, *Paul Adrien Maurice Dirac* (1990), Preface, xv.)
“Geometry, which before the origin of things was coeternal with the divine mind and is God himself (for what could there be in God which would not be God himself?), supplied God with patterns for the creation of the world, and passed over to Man along with the image of God; and was not in fact taken in through the eyes.”


As you see, Kepler was a (neo) Platonist.
A Rational Universe?

• In summary, one key argument for platonism is that the universe is fundamentally *rational*. Intellectual things, like logic, rationality, mathematics, classification, etc. are real and objective. They are not created by human minds.

(Atomism has no place for such an objective rationality. Rationality requires minds, which exist only as accidental collections of atoms, according to atomism.)

• Is this a good argument?
A Paradox for Atomism?

visible world
mountains, trees, plants, animals, etc.

hidden physical reality (atoms)
Lorentzian Manifold (describes the structure of spacetime)
quantised vector fields, etc.
Teleology

- Plato believes in teleology, the view that the various parts of the world have purposes.

(Telos = τέλος = purpose, goal, end, function)

Plato believed that our cosmos was handiwork of a skilled and generous craftsman, a divine being called the demiurge.

E.g. the eye is for seeing, the ear for hearing, etc.
“Intelligent Design”

- The main goal of the contemporary “intelligent design” movement is to return science to a teleological understanding of nature. (It used to be the standard scientific view.)

- E.g. the moon has a purpose, in that life on earth could not exist without it. It circulates nutrients in the oceans, keeps the earth’s rotation on a stable axis, etc.
Innate concepts and knowledge

- The astronomer Kepler (1571 – 1630) thought that God implanted geometrical concepts (square, circle, ellipse etc.) into human minds, as part of the process of making humans in his image.

- Such concepts, present at birth, “not in fact taken in through the eyes” are called innate.
Innate concepts and knowledge

• Plato also had a theory of innate knowledge.

• Plato held that a person’s non-material soul gazed on the Forms prior to incarnation (being joined with a material body).

• Generally speaking, theists like Kepler also have a tendency to believe that some of our concepts and knowledge are innate.
Atomism (Leucippus, Democritus, Epicurus)

• Atoms are eternal and unchanging, apart from their positions and motions. Minds are a certain configuration of matter.

• Atoms have only properties that can be described in mathematical terms. (No “occult”, i.e. hidden, properties.)

• Atomism is a kind of materialism, the view that only matter exists (no spirits, etc.)
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*Geometrical Simple Bodies According to Plato*

• N.B. You don’t have to be an atomist to believe in atoms!
• A dualist can believe that the world consists of atoms and souls, for example.
Materialism and Innate Concepts

• Can a materialist believe in innate concepts and innate knowledge?
Atomism and Perception

“The atomists accounted for perception by means of films of atoms sloughed off from their surfaces by external objects, and entering and impacting the sense organs. They tried to account for all sensible effects by means of contact, and regarded all sense perceptions as caused by the properties of the atoms making up the films acting on the atoms of animals' sense organs. Perceptions of color are caused by the ‘turning’ or position of the atoms; tastes are caused by the texture of atoms on the tongue, e.g., bitter tastes by the tearing caused by sharp atoms; feelings of heat are ascribed to friction.”

(Sylvia Berryman, SEP entry “ancient atomism”)
Problems for Atomism

• Ancient atomism faced several objections from philosophers such as Plato and Aristotle.

• Trying to understand *all* of reality in terms of material atoms has its challenges.

• Similar objections were raised against materialism during the modern period, and even today against contemporary physicalism.
Consciousness?

• Can a system of atoms be conscious?

• By carefully studying a system of particles, is it possible to figure out what conscious experiences it’s having? (Can we tell “what it is like to be” such a system?)

• Why should there be any such conscious experiences?
Free will?

• Can a system of material particles have free will?

• If the particles are deterministic, following rigid mathematical laws, then the system could not have done otherwise.

• If the particles behave randomly, then how is the system in control of its actions?
Origin of Life?

• How can atomists explain the specific complex (and apparently purposeful) arrangements of matter needed for life?

• Appeal to the vast size of the universe, and the principle that even very unlikely events become probable, given enough opportunities?

\[ 6^5 = 7776 \]
The Success of Math and Science

• Can materialism explain the success of mathematics?
• Can materialism explain the ability of humans to do science?
Medieval Philosophy

• Medieval philosophy was based on the works of Plato and (mostly) Aristotle, as well as the Christian Bible.

• For example, Aristotle taught that the earth was stationary, at the centre of the universe, because it is so heavy that it has sunk to the bottom (its “natural place”). The heavens are made of a super-light, indestructible element that naturally moves in circles.
Medieval Philosophy

• Aristotle’s idea that everything in the world has a purpose, a thing that it’s for, fit nicely with Christian theology. Those purposes are God’s plans, of course.

• Aristotle also taught that each non-artificial thing has a *nature*, which causes it to display certain kinds of behaviour. (God gave each thing its nature, as part of his ordering of the creation.)
Medieval Neoplatonism

• Some Medieval philosophers (“realists”) followed Plato in thinking that Forms exist independently of human minds.

• From a Christian perspective, it made sense to think that the Forms are God’s concepts.

• (Since humans are made in God’s image, God has planted concepts in our minds that are patterned after his own.)
Modern Atomism

• “Modern” philosophy belongs to the period from around 1620 – 1920.

• Modern philosophy began when the Medieval world view based on Aristotle and the Bible was demolished.

• One thing that modern philosophers did was revive ancient atomism. It was called “the mechanical (or corpuscular) philosophy”.
The Mechanical Philosophy

• For early modern philosophers (e.g. Descartes, Locke) the mechanical philosophy was a useful approach to most of nature, but not to the human mind. These dualists considered the mind to be a separate, non-material thing.

• Later modern philosophers became sceptical about the mind existing as a separate substance. Some argued that the mind is also a mechanical device, called the brain.
Physicalism

• The doctrine of physicalism (“everything is physical”) results from applying the mechanical philosophy to everything, including the human mind.

• Physicalism is basically the same as materialism, but sounds more up to date.

• (For example, photons are in some sense non-material, since they have no mass. But they are still physical.)
• Physicalism is supported by its explanatory successes.
• Starting in the 17th century, chemical reactions became well understood in terms of atoms and molecules.
• In 1953 Watson and Crick published their model for the structure of DNA, a key element of living organisms.
A Success Story for Physicalism

(DNA replication shown below in computer graphics)
Problems for Physicalism

• Even today physicalism is attacked on the basis of the things that have not been explained in physical terms.

• According to these critics, the very character of physical explanations suggests that no physical explanation of these things is possible, even in principle.
A criticism of physicalism

“There are some casts of mind that want to regard anything that they don’t know how to understand in their favorite way as an illusion.”

• Ned Block, *Closer to Truth* (TV show)
“… I believe there are independent empirical reasons to be skeptical about the truth of reductionism in biology. Physico-chemical reductionism in biology is the orthodox view, and any resistance to it is regarded as not only scientifically but politically incorrect. But for a long time I have found the materialist account of how we and our fellow organisms came to exist hard to believe, including the standard version of how the evolutionary process works. The more details we learn about the chemical basis of life and the intricacy of the genetic code, the more unbelievable the standard historical account becomes.”

“The intelligibility of the world is no accident. Mind, in this view, is doubly related to the natural order. Nature is such as to give rise to conscious beings with minds; and it is such as to be comprehensible to such beings. Ultimately, therefore, such beings should be comprehensible to themselves. And these are fundamental features of the universe, not byproducts of contingent developments whose true explanation is given in terms that do not make reference to mind.”

• (Nagel again)