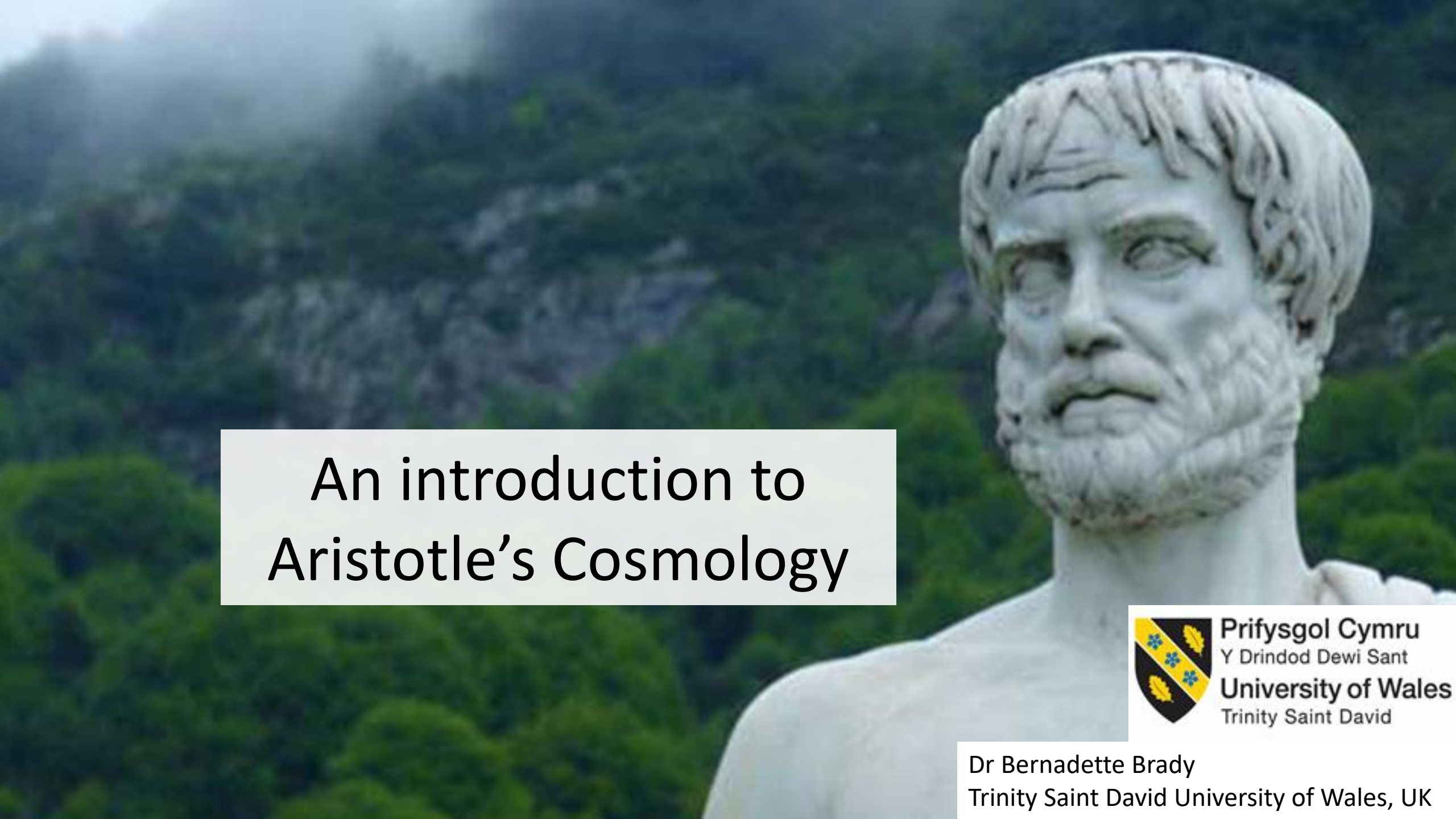




An introduction to Aristotle's Cosmology



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Dr Bernadette Brady
Trinity Saint David University of Wales, UK

Aristotle 384-323 BCE

At the age of 17 Aristotle went to study at the **Academy**, under Plato, and lived there for 20 years.

Plato nick named him 'The Brain'. It is considered that Aristotle had a strong influence on some of Plato's later work.

'The School of Athens' (1510-11) by Raphael

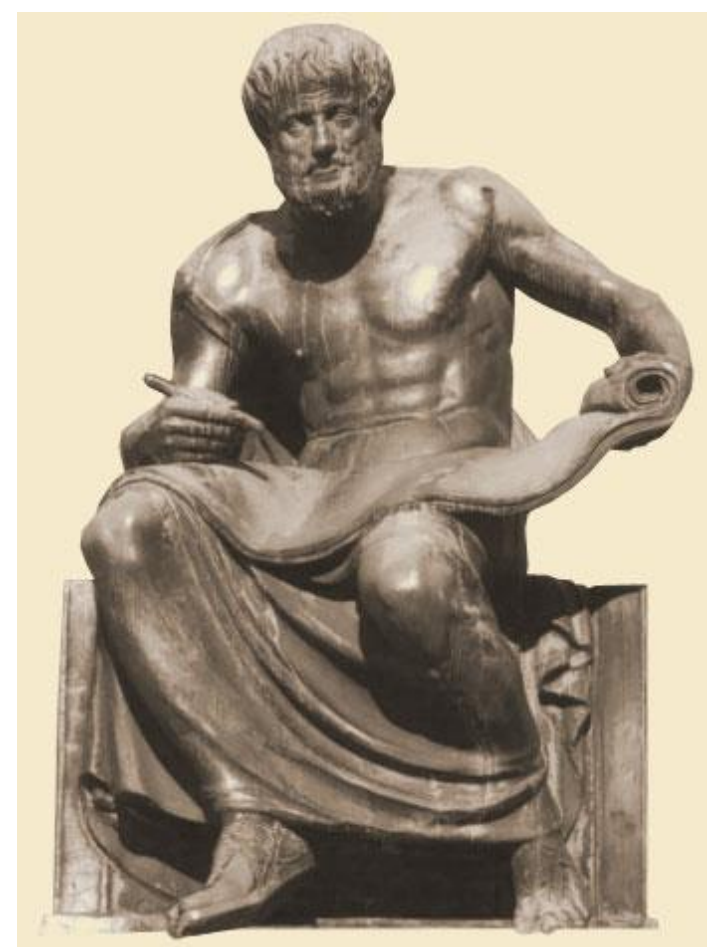
Plato points to the heavens and
Aristotle points to the earth.



Aristotle 384-323 BCE

Upon Plato's death in 347 BCE he left Athens and by 343 BCE he became the tutor of the son of Philip II of Macedonia – Alexander the Great.

Socrates taught Plato, Plato taught Aristotle and Aristotle taught Alexander the Great.



Aristotle then started his own school called the **Lyceum**, which was named after a nearby temple to Apollo. Its members became known as the '**Peripatetics**' after the name of the court yard that Aristotle would stroll along while lecturing.

Aristotle on the Heavens

Alan Bowen and Christian Wildberg suggest that Aristotle's goal in *De caelo*, written after Plato wrote the *Timaeus*, was to 'formulate a critical response to the "unscientific" character of his teacher's natural philosophy.'

Note: This is a secondary source, a comment about Aristotle.

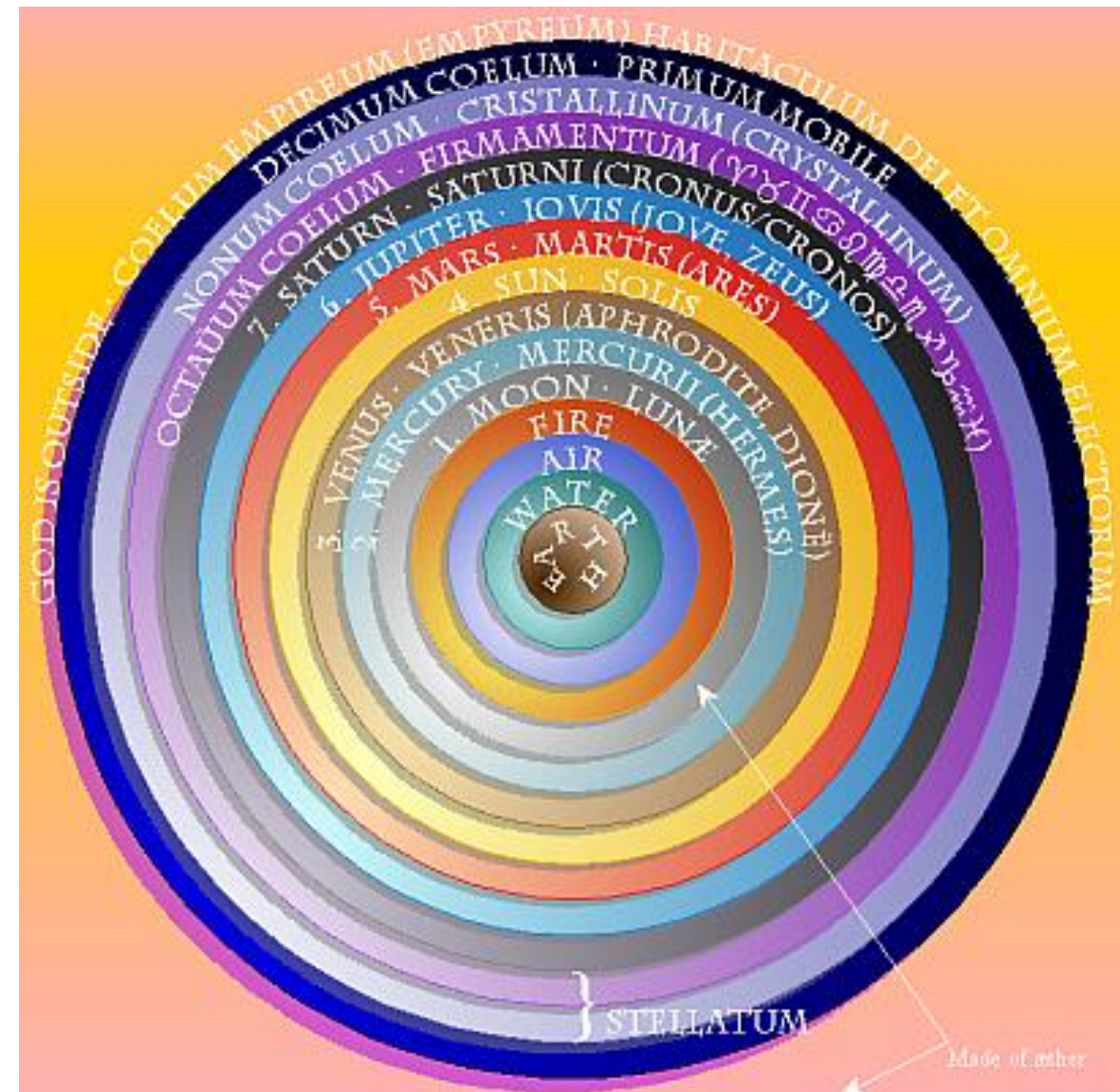
Aristotle's *De caelo* available online:

<http://archive.org/details/decaeloleofric00arisuoft>

William Lane Craig, *The Cosmological Argument from Plato to Leibniz* (Eugene, Oregon: Wipf and Stock, 2001 [1980]), p.37.

Craig, *The Cosmological Argument from Plato to Leibniz*: p.42.

Alan C Bowen and Christian Wildberg, "Introduction," in *New perspectives on Aristotle's De caelo*, ed. Alan C. Bowen and Christian Wildberg (Amsterdam: Brill, 2009), p.1.



Aristotle on the Heavens

Aristotle's cosmology, like Plato's contained a 'divine unmoved' as his primary source of motion. For Aristotle the Prime mover 'produces motion by being loved and it moves the other moving things.' (Aristotle, *Metaphysics*: 1072b 3-4.)

In *De caelo*, Aristotle confirmed that not only is the prime mover responsive to love but that each of the planets, moving in its own sphere, is also the seat of a divine essence:

‘We think of the stars as mere bodies, and as units with a serial order indeed but entirely inanimate; but we should rather conceive them as enjoying life and action.’
(Aristotle, *On the Heavens*: II.16-22.)

Note: This is a primary source, a direct quote from Aristotle



Source gallica.bnf.fr / Bibliothèque nationale de France

Nicole Oresme, *Traité de la sphère*;
Aristotle, *De caelo et de mundo*,
French translation [Du ciel et du monde] by Nicole Oresme

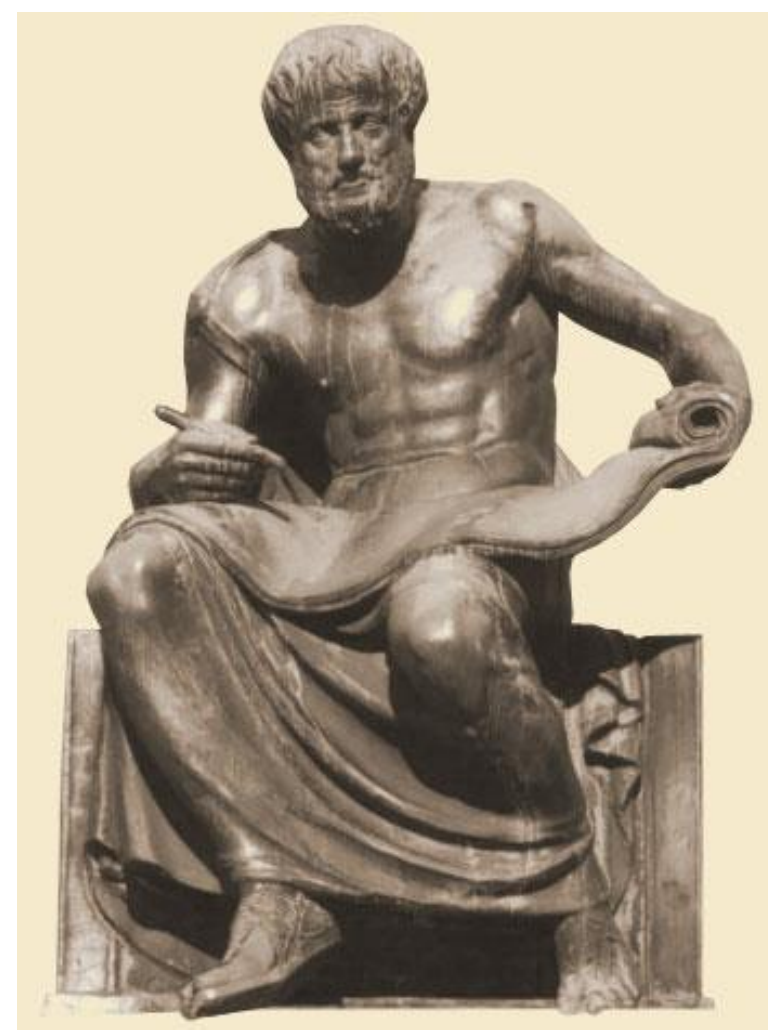
Aristotle on the Heavens

In *Meteorology* Aristotle linked this movement of the heavens, these living stars, to the cause of all things on earth:

‘this world necessarily has a certain continuity with the upper motions; consequently all its power is derived from them. (For the originating principle of all motion must be deemed the first cause.)’

Aristotle, *Meteorology*: 339a 19-24.

Note: This is a primary source, a direct quote from Aristotle



In summary: for Aristotle, the living stars, through the eternal movement initiated by the love of the unmoved mover, were responsible for all movement on the earth.

Aristotle's and the Senses

Aristotle considered that **sense-perception** was the basis of knowledge and in this way he disagreed with his teacher Plato.

Aristotle argued that knowledge was discovered by a empirical approach - naturalism.



In the **Republic Bk. VII, 514a-518c**, **Plato** put forward the idea that our sense were incomplete as we lived in a 'cave' and that the real world was outside of our senses. Thus the cave represented the limited world of human perception, Aristotle disagreed and wanted to explore and understand the 'cave' itself.

Aristotle and Phenomenology

Edward Casey defines Aristotle as a **protophenomenologist** for Aristotle considered that the **senses spoke of the world, rather than mental ideals and abstract forms** about a possible divine the world where the living world was viewed as nothing more than a pale or inferior imitation.

Aristotle's approach to the natural world was, as Casey states,

‘the active ancestor of the phenomenological approaches that, in the writings of Husserl and Merleau-Ponty, question the superimposition of the geometry and call for a recognition instead of the world's immanent shapeful order.’

Note: This is a secondary source, a comment about Aristotle.

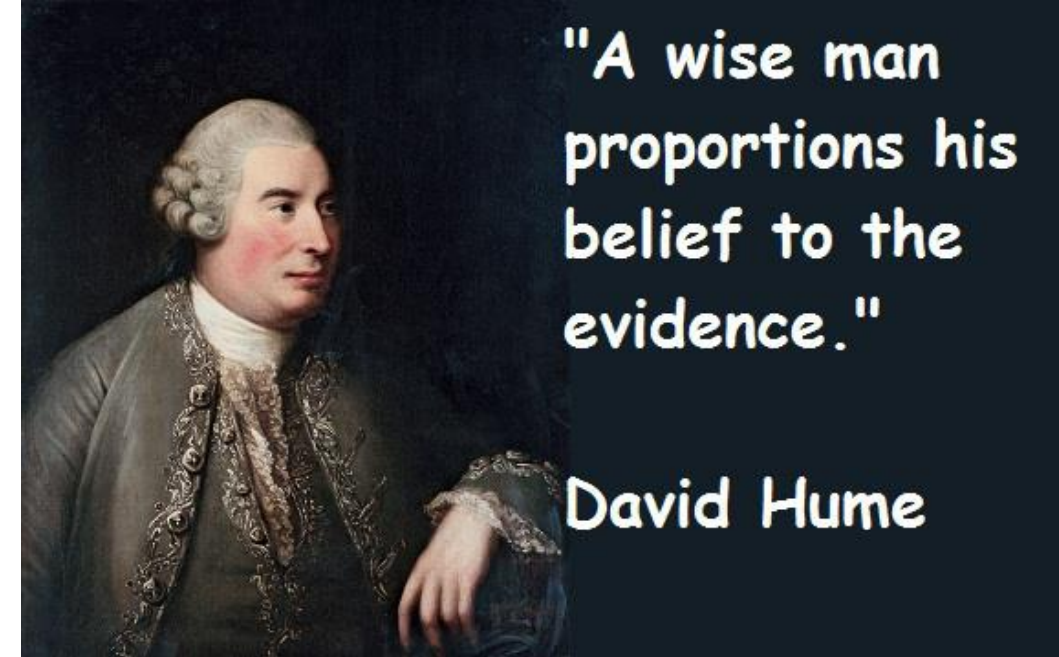
Casey, Edward S., *The Fate of Place, a Philosophical History* (Berkeley, CA: University of California Press, 1998). P.57

The influence of Aristotle's Naturalism

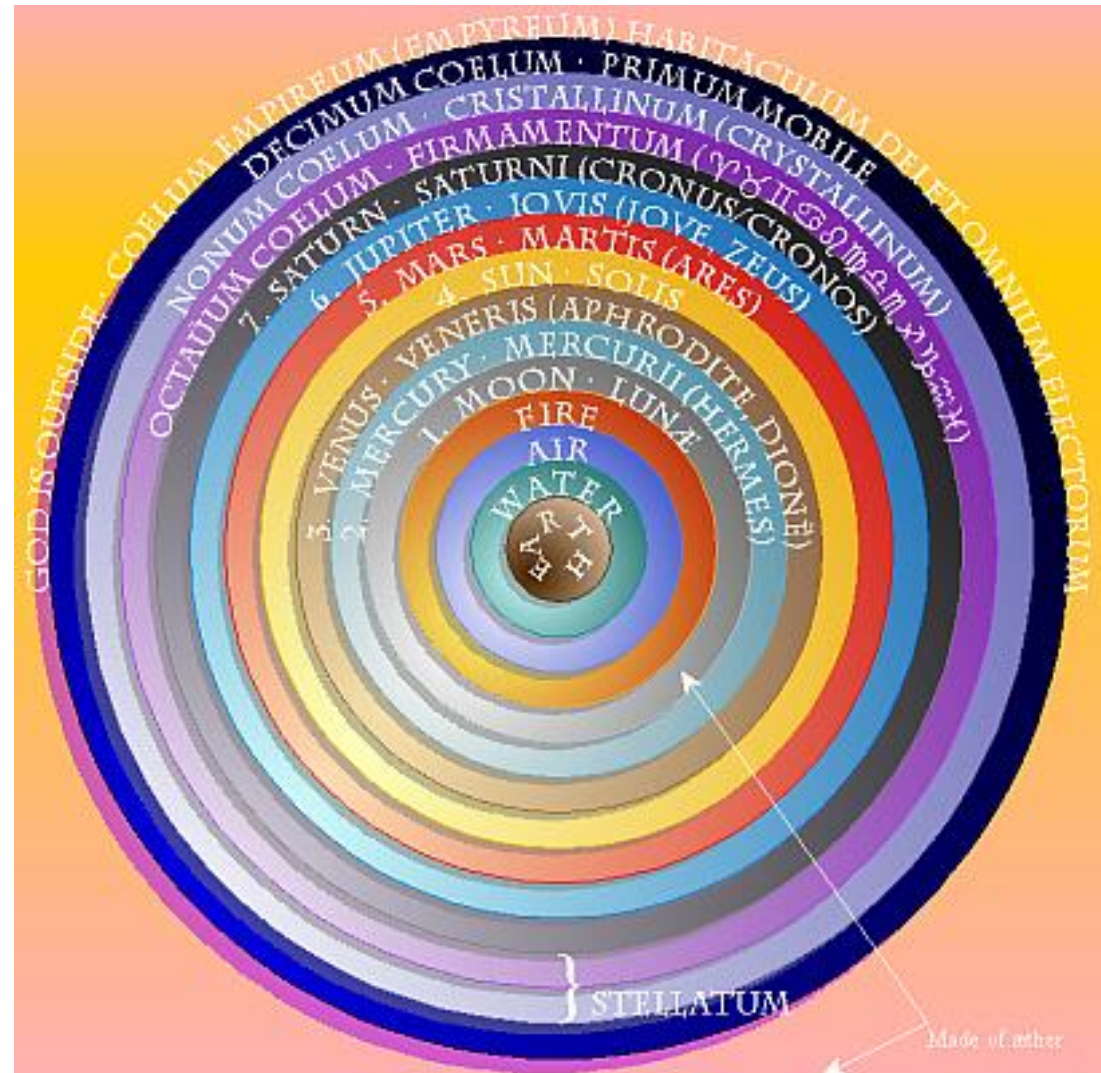
- Aristotle's naturalism/phenomenology lead to two developments.
 - It laid the foundation for the development of the empirical sciences.
 - Through the work of Saint Thomas Aquinas, it was a foundation stone of the twelfth century reform of Christianity.¹

Aristotle's naturalism was also central to philosophers such as the David Hume (1711–1776) who changed the debate around fate and ushered in the modern era of determinism.

1. John R. Bowlin, "Sieges, Shipwrecks, and Sensible Knaves: Justice and Utility in Butler and Hume," *The Journal of Religious Ethics* 28, no. 2 (2000): p.274



David Hume, Section X of An Enquiry Concerning Human Understanding.



Key points about Aristotle's Cosmology

Aristotle – Qualities a part of his causal model

Aristotle adopted Empedocles' (490 -430 BCE) notion of elements and added a fifth element – aether.



Subject to change

Earth, which is cold and dry.

Water, which is cold and wet.

Air, which is hot and wet.

Fire, which is hot and dry.

Not subject to change

Aether, was the divine substance that made up the heavenly spheres and heavenly bodies (stars and planets).

Aristotle – Movement and Proper Place

Aristotle's notion of gravity was that all things moved in the manner of their nature. Thus things comprised of earth moved towards the earth, things of air moved towards air and so on. Thus things made of Aether moved towards other divine things and not the sublunar realm.

In this way all things had their **proper place** and moved towards that place. See *Physics* 208b11. This 'gravity' is the basis of Aristotle's teleology and the driving force of his cosmology.

For Aristotle, unlike the Stoics, movement is not causal – that is one body influencing another, but was instead a result of a body's nature. Hence, for Aristotle, the planets were living entities that moved according to their own nature.

This is explored in *Sacred Geography* where the idea of a body's desire to move to its proper place is linked to people's relationships to landscapes.

Aristotle's Causal Model

[*Physics* II.3; and (extensively) and in *Metaph.* A.3 ff. See also *Part. An.* 639b12ff, *APo.* II.11; *Metaph.* D.2; *Gen. et Corr.* 335a28-336a12.]

Aristotle searched for the ultimate cause of things and he established that there **were four and ONLY four** in the world. These were:

- The **material cause** – the bodily constituents out of which something comes – this is generally the modern notion of a body's material substance.
- The **efficient cause** – the means by which it is brought into existence.
- The **formal cause** – pattern of a thing that is to be formed. Not to be confused with Plato's ideal forms. Aristotle's forms did not exist independent of the object - i.e. the formal cause of a table is to have four legs and a flat top.
- And the **final cause** – the end or purpose or goal of the thing. This is considered a teleological concept.

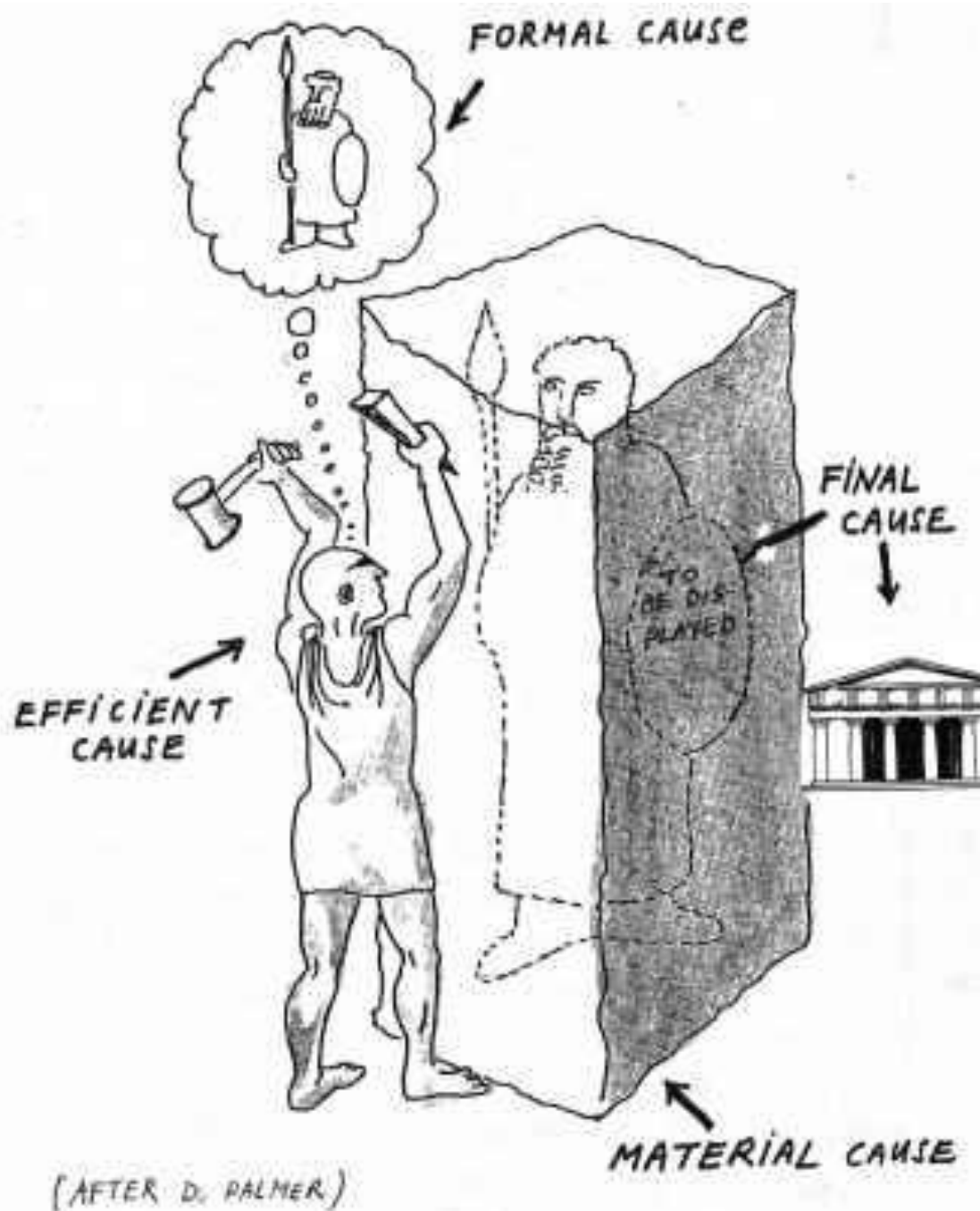
Aristotle's four causes

Material –stone

Efficient – the mason

Formal – the plan

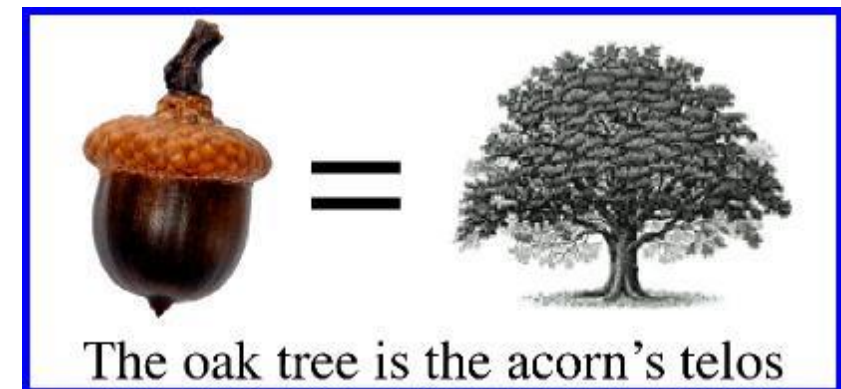
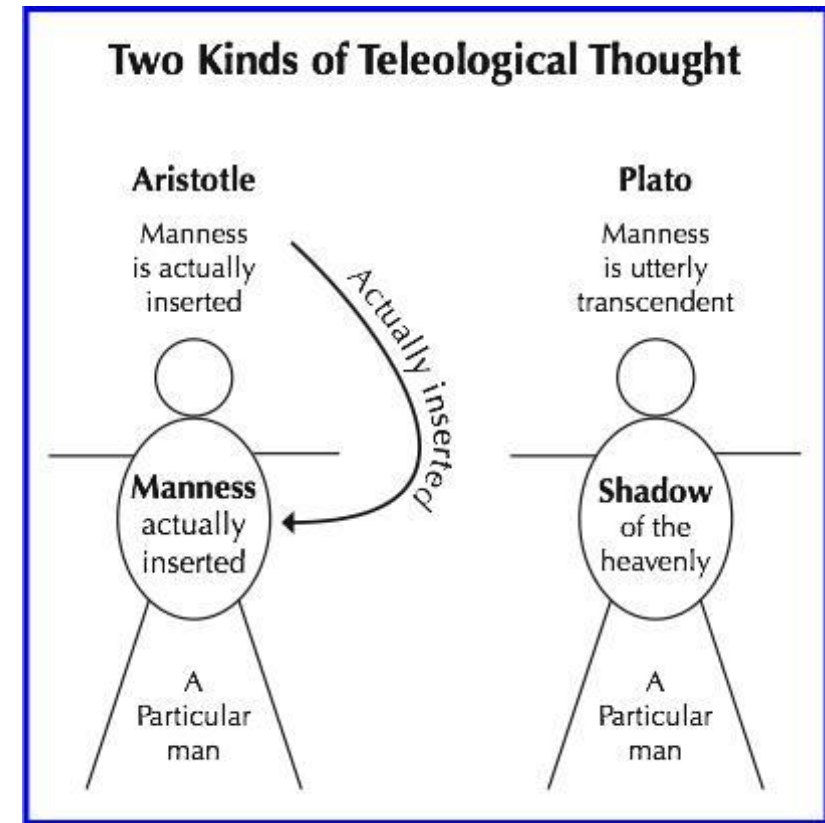
Final – The goal –
This is also seen as the
teleological nature of the
stone, its desire to be a
statue which is displayed in
the forum.



Aristotle's Telos vs. Plato's Telos

Aristotle's final cause can be argued to be teleological – i.e. the cause of a movement is not antecedent, something in the past, but is instead 'caused' by something in the future. **A body's desire for its proper place.**

Plato had considered that the soul's movement was teleological drawn towards the divine. However, for Aristotle, this teleological movement was the concept of the acorn growing to an oak tree. A seed therefore contains the potential of its final form.



Aristotle's and Plato's views on soul

Where Plato saw the soul in three parts – Appetitive (desire), Spirited (sensory and motivating, the will) and Rational (thinking) with the rational being linked to the divine, Aristotle took a different view.

Aristotle's Hierarchy of Souls

- As psyche was the principle of life, or autonomous motion, then all living things have souls.
- The soul was made up of three levels, based on the nature of the living thing:
 - Nutritive soul (plants)
 - Sensitive soul (all animals)
 - Rational soul (human beings)

Aristotle's soul was linked to life

The question for Aristotle on soul is whether the soul can exist independently of the body. Plato considered that the soul could exist separately from the mortal body however Aristotle, linking the idea of soul to life force, stated:

... the soul does not exist without a body and yet is not itself a kind of body. For it is not a body, but something which belongs to a body, and for this reason exists in a body, and in a body of such-and-such a kind (414a20ff).

For Aristotle the soul was mortal and could not exist separate to the body. However, in *De Anima* iii 5 he wavers on this point and introduces a new concept of *active intellect, or active mind* which can be separate.

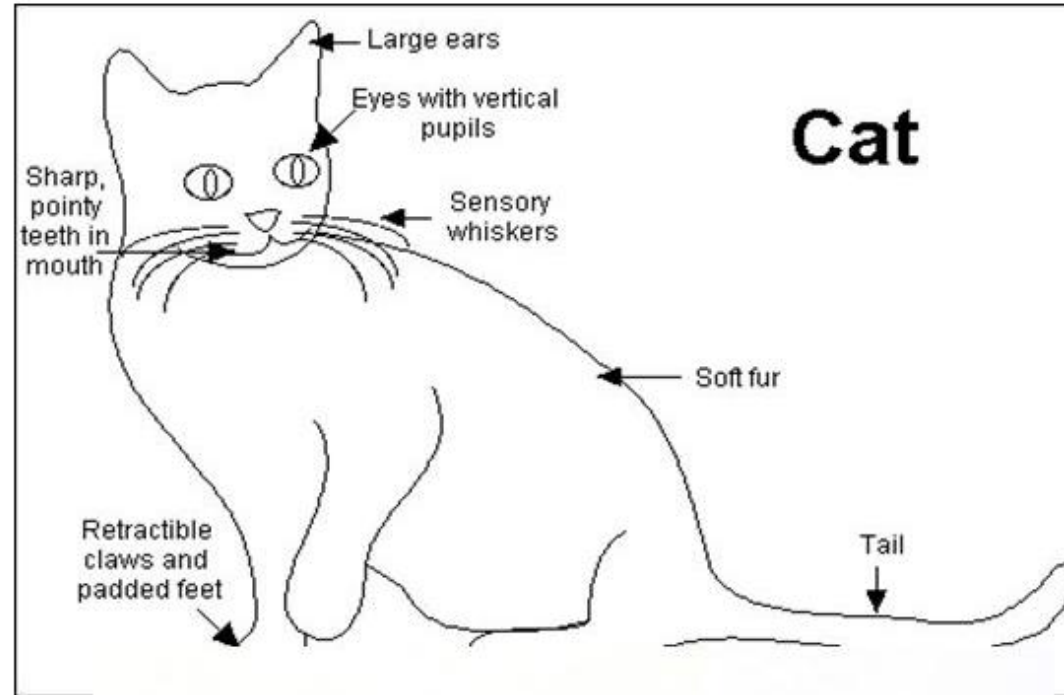
Universals verses Particulars

The nature of reality.
Plato's worldview.

Universals vs. Particulars

Universals are perfect
and emanate from the
Good.

Particulars are imperfect
manifestations of the
Universals.



Aristotle disagreed

The cat contained
within itself the perfect
nature of cat.

Catness (universal) did
not exist independent
of cats (particulars).
Metaphysics (1028b5),
(1017b25).

This becomes
important for 20th
century astrology.

Alan Leo

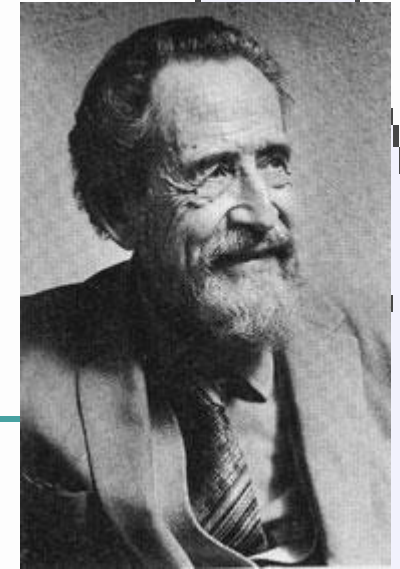
- The horoscope is viewed as the material world that the soul needs to transcend – **Plato**.

Dane Rudhyar and humanism

- The horoscope is viewed as the image of our perfect self – **Aristotle**.

Margaret Hone, psychological astrology and also a form of humanism

The horoscope is viewed as a reflection of the patterns of the world we are born into - **Stoicism**.



Additional References

- Falcon, Andrea. "Aristotle on Causality." *The Stanford Encyclopedia of Philosophy* (2011), <http://plato.stanford.edu/archives/spr2011/entries/aristotle-causality/>.
- Fine, Kit. "Aristotle on Matter." *Mind* 101, no. 401 (1992): 35-57.
- Frede, Dorothea. "Accidental Causes in Aristotle." *Synthese* 92, no. 1 (1992): 39-62.
- Gerson, Lloyd P. "The Unity of Intellect in Aristotle's 'De Anima'." *Phronesis* 49, no. 4 (2004): 348-373.
- Lang, Helen S. "Aristotelian Physics: Teleological Procedure in Aristotle, Thomas, and Buridan." *The Review of Metaphysics* 42, no. 3 (1989): 569-591.
- Leunissen, Mariska E.M.P.J. "Why the Stars Have No Feet, Explanation and Teleology in Aristotle's Cosmology." In *New Perspectives on Aristotle's De Caelo*, edited by Alan C Bowen and Christian Wildberg, 215-238. Amsterdam: Brill, 2009.
- Luce, J.V. *An Introduction to Greek Philosophy*. London: Thames and Hudson Ltd. , 1
- Miller, Fred, Aristotle Political Theory <http://plato.stanford.edu/entries/aristotle-politics/> accessed 1 October 2011
- Matthen, Mohan. "Why Does the Earth Move to the Centre? An Examination of Some Explanatory Strategies in Aristotle's Cosmology." In *New Perspectives on Aristotle's De Caelo*, edited by Alan C. Bowen and Christian Wildberg, 119-138. Leiden: Brill, 2009.
- Solmsen, Friedrich. "Aristotle and Presocratic Cosmogony." *Harvard Studies in Classical Philology* 63 (1958): 265-282.

<http://classics.mit.edu/Browse/browse-Aristotle.html>

Online archive of Aristotle's works.