

# Greek natural philosophy and the Christian Tradition

- **Hellenism** - spread of Greek culture from about 333 BC (time of Alexander the Great) to 63 BC (Roman domination). Rome continued the tradition.
- **Birth of Christ** Jesus Christ was born in Roman-occupied Israel and grew up in a cultural climate where Greek was the language of the educated and wealthy classes.

In adulthood, Jesus rejected this Greek culture and established, in his local language of Aramaic, a religion for ordinary people living in harsh times. This religion was based on the scriptures of Jewish people of the area.

- **Philo of Alexandria (c. 20 BC - 40 AD)** - early synthesis of the Hebrew (Jewish) religious tradition with Greek philosophical thought.
- **Metaphysical idealism** and **secular skepticism** both take hold.

- **Neoplatonism** - a spiritual re-interpretation of Platonic thought.
  - Idea: there is a great order consisting of many levels and kinds of existence; at heart of it is ‘**the One**’.
  - Cosmos - divine emanation (a sort of radiation) from the One. The first emanation is the **divine Mind/Intellect or *Nous*** , a sort of universal wisdom (which contains the world of ‘ideas’).
  - From the *Nous* comes the **World Soul** from which, in turn, all living things (things of the world of the senses - eggs, stones, animals, humans ... ) get their souls. (In our discussion of Aristotle’s teleological philosophy, these would have been called ‘*nous*’.)
  - World Soul - intermediate between the *Nous* and the material world.
  - Neoplatonism had a big influence of the development of Christianity. One thing it did was provide a way of understanding the Judaeo-Christian vision, which was taking hold in the Greek cultural environment of the Roman world.

Neoplatonism	Judaeo/Christian
The One	God
Divine Mind/ <i>Nous</i>	Son or Logos
World Soul	Holy Spirit

- Structurally similar, with an essential difference: in Neoplatonism, all three are transcendental; in Christianity, through Christ, God has made direct contact with the imperfect world of the senses. This gives human history a spiritual - not just material significance.
- What was transcendent in Greek philosophy has, in Christianity, become immanent.  
‘And the word became flesh and dwelt among us ...’ (The Bible, John, chapter 1, verse 14.)

- **The Romans formally embrace Christianity** (312 AD)

Emperor Constantine - from 380 AD Christianity became the official religion of the whole Roman Empire.

- **St. Augustine** (354-430 AD) - in sympathy with neoplatonism, **identified Christian God with the divine creator of Plato's world of ideas.**

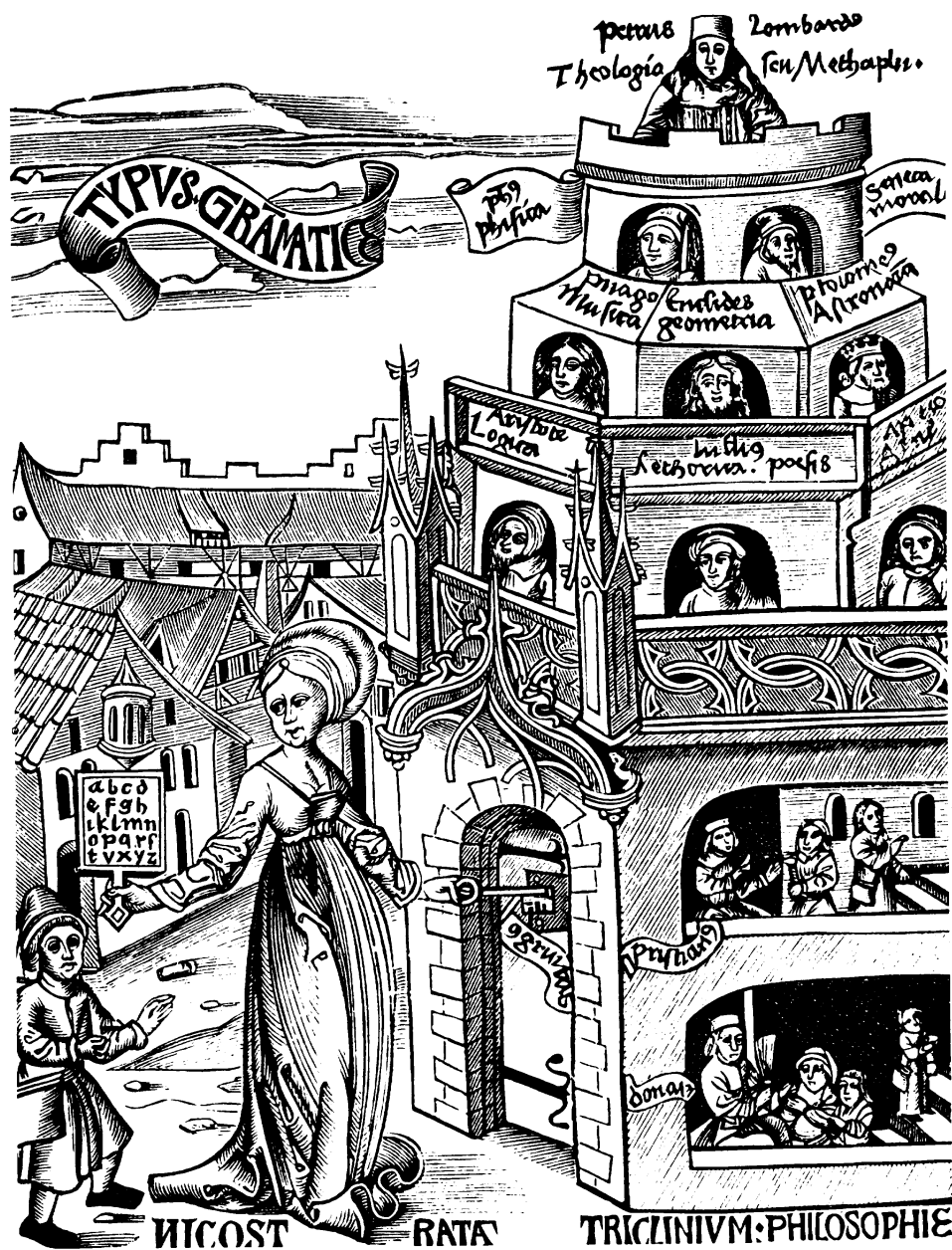
- **St. Thomas Aquinas** (1225-1274 AD)

Renewed interest in the question of the compatibility of Christianity and Greek thought.

St. Thomas Aquinas argued that knowledge (in particular knowledge of God which was the main aim of learning at this time) comes from two sources:

- Reason - using information gleaned from the senses.
- Faith and Christian Revelation.

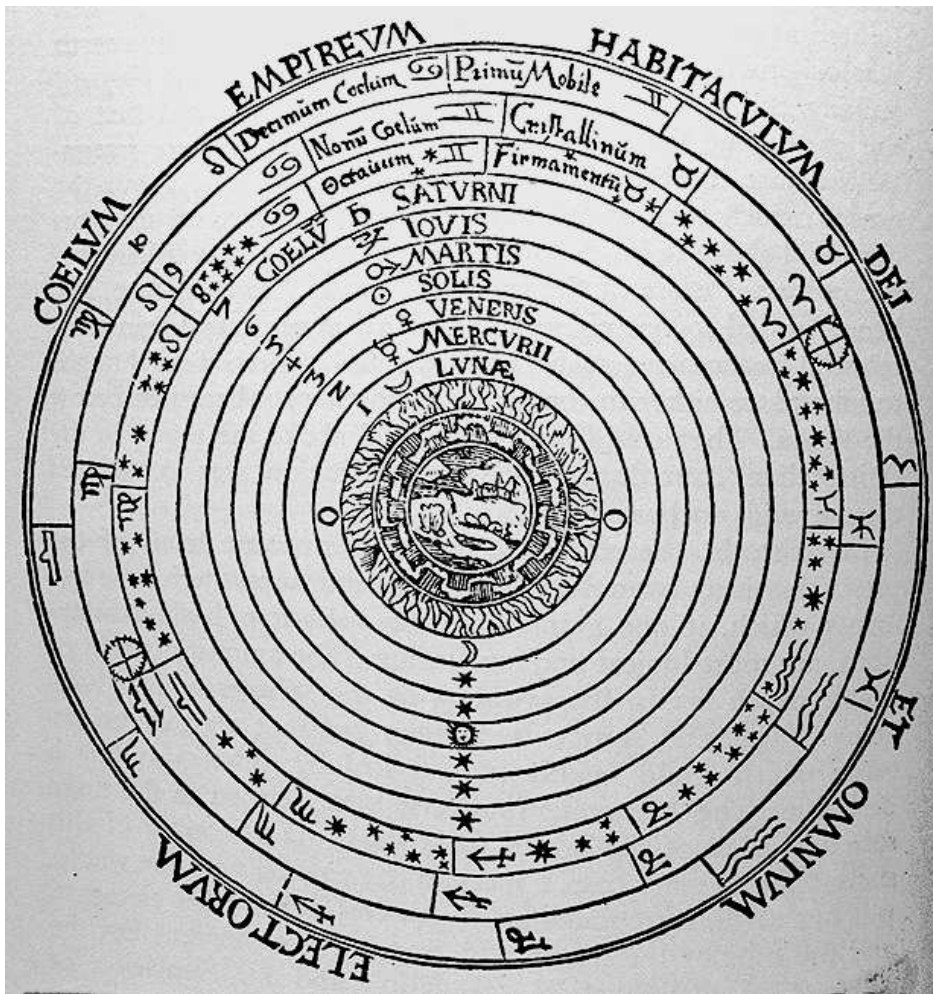
Both come from God, who cannot contradict Himself; so they must be in agreement. Grand philosophical scheme.



### A Representation of Medieval Learning

Top: Peter Lombard representing Theology and Metaphysics.

Also featured: Seneca, Euclid, Ptolemy and Aristotle.



An Engraving of a Christian Aristotelian Cosmos from Peter Apian's *Cosmographia*

We see earth, being the heaviest and most imperfect, is at the centre, surrounded by water. The imperfection of this sublunary sphere is represented by land showing above the waters. Next we have the spherical shells of air then fire, before we reach the celestial realm. This consists of nested spherical shells beginning with that of the moon (*Lunæ*) and ending with the *Coelum Empireum Habitaculum Dei et Omnium Electorum*, the Empyrean heavens, the dwelling place of God and all the elected ones), the perfect unchangeable layer. Here, the eternal Prime Mover of Aristotle has been replaced by the Judaeo-Christian creator God.

It was commonly believed that departures from this order were linked with disasters: 'These late eclipses of the sun and moon portend no good to us.' (Gloucester in Shakespeare's *King Lear*; c 1605.)

Shakespeare is full of wonderful references to this Aristotelean world view.

**This is the metaphysical idealism tradition.**

**BUT:** the view had been growing from the 13<sup>th</sup> century, that there was another way to gain knowledge of God - by examining His creation in detail: Nature cannot lie! At the same time, within the same church, the secular skepticism tradition was evolving towards what we now recognise as science.

The scientific baby was kicking in the womb about three centuries before it was 'born'.



## How did ‘science’ progress away from Aristotle?

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Shortly after Aquinas, medieval theologians began to question Aristotle.

- Roger Bacon’s *Opus Maius* **On Experimental Science**, 1266:

‘ ... I wish now to review the principles of wisdom from the point of view of experimental science, because without experiment it is impossible to know anything thoroughly.’

This attitude towards nature, that we should handle it and study it, is compatible with a mental frame of mind that regards nature as good.

- In 1277 the Bishop of Paris issued a condemnation of propositions by Averroists (radical followers of Aristotle): one of these propositions stated that heavenly bodies could not be made to travel in straight lines. This seemed to imply that the Creator had limited powers.



- View began to emerge that a logical strictly mechanical universe could be seen as a manifestation of the power and intelligence of the Creator.

Oresme (1323-1382), building on the impetus theory of John Buridan (1300-1358):

**God, when He created the world, moved each of the celestial orbs as he pleased, and in moving them He impressed on them impetuses which moved them without His having to move them anymore except by the method of general influence whereby he concurs as co-agent in all things which take place.**

Freeman Dyson, Institute for Advanced Study in Princeton argues:

**‘It is probably not an accident that modern science grew explosively in Christian Europe and left the rest of the world behind. A thousand years of theological disputes nurtured the habit of analytical thinking that could be applied to the analysis of natural phenomena’.**

# Science emerges during the Reformation

- **The Reformation**<sup>1</sup>: protestant reform movements in the Christian Church.

(**Key people:** Martin Luther, John Calvin, John Knox ...)

- Biblical revival and translation of Bible into ordinary language
  - An improvement in the intellectual and moral standards of the clergy
  - Emphasis on the sovereignty of God
- **Why did science take off during the Reformation?**

Why not 2000 years earlier in Athens, or even earlier in Babylon, China, Egypt, India ... ?

- For Einstein this was not the right question: for him the amazing thing was that science had ever taken off.
- Others feel that the spirit of the Reformation was significant ... that the intellectual freedom of the time gave the necessary impetus for the **secular skepticism** tradition to try to re-assert itself ...

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<sup>1</sup>Information from the *Cambridge Encyclopaedia*.

# The Rise of Causality

- **Causality**<sup>2</sup> a word that entered philosophy via science after the time of Newton
- describes the relationship between two events in terms of the application of a rule of ‘law’ of nature.

... implication that nature is predictable because of the existence of these ‘laws’

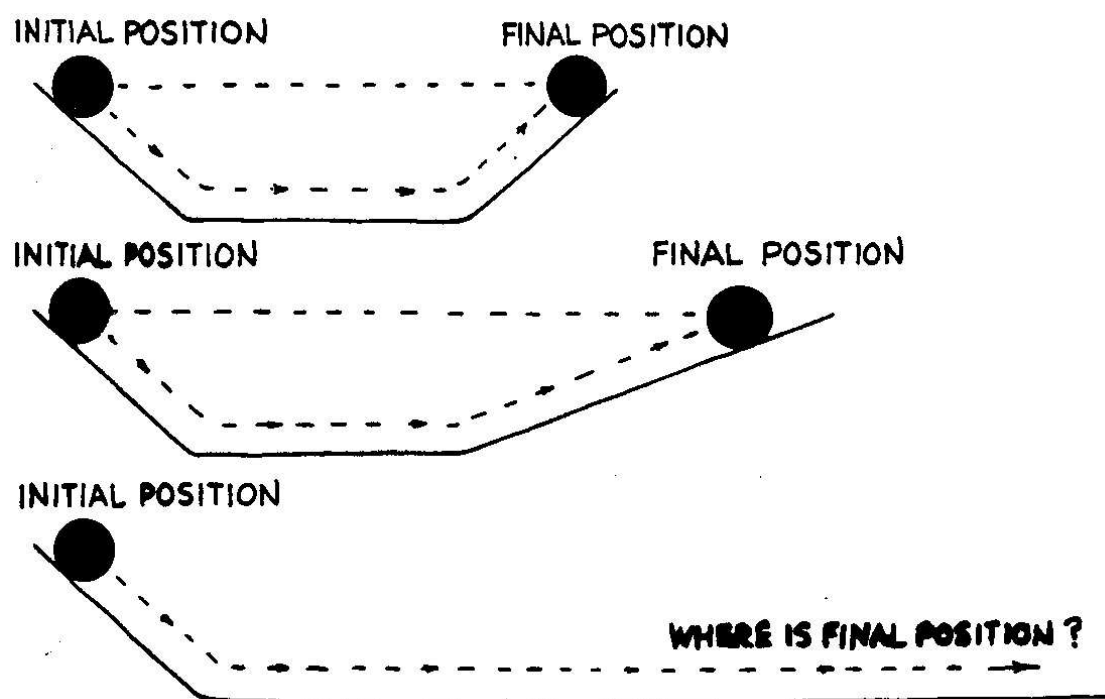
... the idea that a similar causality applied outside physics was a cornerstone of the Enlightenment ...

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<sup>2</sup>For our purposes.

# Galileo's Key Experiment

Discuss this experiment<sup>3</sup>



**Conclusion:** the object will continue to move in a straight line with a steady speed.

**Forces produce changes in motion**

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<sup>3</sup>Figure taken from excellent book *Conceptual Physics* by Hewitt.