**Seminar notes week 2**

**Outline of the readings**

**Peter Dear** – core text for this block of the module, ie. up to reading week

Chapter 1, What was Worth Knowing in 1500

* About Europe
* Aristotle – fundamental to universities
* Universities

Chapter 2, Humanism and Ancient Wisdom: How to Learn Things in the Sixteenth Century

* 1500-1600
* Revival of antiquity
* Yes, Aristotle was already part of university curriculum, but 16th century humanists discovered new ancient texts, new ancient authors, and read the known texts (including those of Aristotle) in new ways

**Floris Cohen**

* Looking at different way of viewing the world in different places
* Looking and comparing the basic structure of knowledge 🡪comparing mathematical to philosophical 🡪 Athenian (philosophical) and Alexandrian (mathematical) 🡪 these are the cities those thoughts were prevalent in.
* 400 BC-100BC
* Comparing modes of natural knowledge
* Comparing Greece to China 🡪 Chinas empirical way of looking at nature

Note that this seminar is confined to Dear, Chapter 1, ie. Aristotle’s theories as they appeared in the university curriculum c. 1500.

**Aristotelian world view (recap of lecture)**

* If there is one individual who defined pre-modern science in Europe it was Aristotle
* Here are the basics of his world-view:
* Everything made of **4 elements** ie. water, earth, air, fire – the first two of these are heavy so move downwards, the latter two light so move upwards
* Everything made of **4 qualities**, ie. hot, cold, wet, dry
* **2 realms** = terrestrial and celestial – official division between these two realms is the path that the moon traces out.

**Using Aristotle’s world view to explain phenomena**

Students got into pairs to discuss one phenomenon of their choosing; we then discussed these phenomena as a group

Think about the sort of things that make up these objects, eg. the elements Earth and Water – this is what Aristotle called a ‘material cause’

Think also about how these things phenomena were formed – what Aristotle called the ‘efficient cause’

It’s also useful to think about the two exhalations, ie. the hot and the moist exhalations, since these help to explain most phenomena between the surface of the earth and the moon

**Dew**

* Before dew becomes dew its hot and wet (air) then it needs to be cooled down to become dew. Its heavy body element (water) so it falls down to the earth, the reason it can change (transform) is because it is a terrestrial element. The reason it disappears is because it heats up (becomes air) and becomes lighter.
* Air = hot and wet
* Dew = water = cold and wet

**Projectile motion**

* projectile motion = throwing something sideways, eg. an arrow, cannonball, football...
* let’s start with the simple case of simply dropping something vertically to the ground, eg. why does the whiteboard marker fall to the ground when I release it?
* Because it’s made of the element Earth, and all Earth seeks its natural place, which is the surface of the (planet) Earth.
* The background here is Aristotle’s theory that the sublunary sphere is made up of spheres of the elements Earth, Water, Air and Fire, in that order (though this is confusing since the earth is obviously not covered entirely in water!)
* The marker also falls for another reason, namely that the natural place for the element Earth is the centre of the universe, which is the centre of the Earth
* Note that cosmology comes in here, ie. the theory that the planet Earth is at the centre of the universe
* Note also the wider idea that there are certain privileged places in the universe, and bodies tend to seek out these places (they ‘endeavour’ to reach these places, in the Aristotelean jargon)
* True projectile motion – ie. when I throw the whiteboard marker sideways – is more complicated
* It’s also a completely different kind of motion, because there is nothing ‘natural’ about sideways motion – when the pen moves sideways it’s not getting closer to any natural place
* The sideways motion is what Aristotle called ‘violent’ motion – as well as not being natural, it is irregular, unpredictable, and transient

**The fact that the planets move**

* Stars are on the outer edge
* All orbits are centred on the earth
* Each planet has their own orbit
* How do the planets move? – This is a theory put forward by Aristotle which survived
  + Everything above the moon is made of quintessence
  + Each planet is in its own individual invisible sphere that spins around the Earth.
  + Then in the religious heavens from the outside past the stars God will turn the stars to set it all in motion and this will create a domino effect which will turn all the other spheres.
  + (Christian theologians referred to ‘God’, but Aristotle simply referred to a ‘Prime Mover’, ie. an entity that sets everything in motion)
  + Each sphere touches the one inside it, and that is how the domino effect is able to work
  + But note that this model is not perfect – it implies, for example, that all planets have the same year, ie. that they all complete one circuit around the Earth in the same period of time

**Shooting stars**

* Hot exhalations (air and fire) are bombarding the moon, and its sphere made of quintessence, as these exhalations rise from the Earth
* These collisions create a lot of heat
* When there is enough heat, the hot exhalations are ignited to make shooting stars

**General lessons to draw from this exercise**

* It’s one thing to write down the basics of Aristotle’s world view, another to actually apply it to explain stuff
* The Aristotelian world-view had a lot of attractions – it was simple, it covered a wide range of phenomena, it could explain these phenomena in some detail, it was couched in commonsensical language, and it was flexible ie. it suggested multiple explanations of any one phenomenon
* These attractions help to explain why the world-view lasted so long
* But don’t forget the social and institutional reasons for this persistence, especially the fact that Aristotle’s theories were embedded in Christian theology and in the University curriculum