Journal Entry 3
Covering lectures and readings from the week of 9/13

We began our discussion with something that was completely new to me, which was that the original Catholic dogma was based around Platonism. I had never connected the famous philosopher with religion before. After reading a little of Plato's writings, it does make sense. I think I see what Professor Brock is talking about when he says that analyzing things in terms of their essence is something done frequently in mathematical physics, particularly when speaking of atoms and their components. From the reading I have done in T*he How and the Why*, it seems as though much of early astronomical work was done with purpose of "saving the appearances". According to David Park, one astronomer after the other, from Eudoxus to Aristotle, tried to save the phenomena. They wanted to explain the universe, while not going against the philosophical ideas of their time.

I get what Plato means with the Allegory of the Cave. We are supposedly blind to what is real; what we think is real, is not what actually is. This kind of reminds me of the concept behind T*he Matrix*, which, like the thing with the Catholic dogma, I never connected with Plato until now. What I do not fully understand is how one can discover what actually exists through mathematics.

When discussing Aristotle in class, and reading about him in HW, it is apparent that he was very detailed in everything he did. Park says that Aristotle wanted every theory to be logically adequate and constructed without errors on clearly stated assumptions of a fundamental character. So basically Aristotle used logic to build from a solid foundation. Professor Brock discussed some of the differences between Plato and his student. While Plato thought our perceptions are not to be trusted, Aristotle felt that they must be used to gain knowledge about nature. Park makes a key difference between the philosophers clear when he says that according to Aristotle, "perception is the process in which the form of a thing enters the soul - not some representation of the form but the form itself". Plato did not think that the form of something comes to us through perception. Park also seems to suggest that Plato and Aristotle have different meanings for the word "form". Plato and Aristotle also differ on the subject of change. Aristotle said there are three kinds of change. These are changes in quality, quantity, and place. Park says that Plato did not define change for the ideal world. So for Plato, change did not exist in the real world. As far as Aristotle's concept of change in place, he defined two types; natural and violent motion. His insistence that the Earth is stationary because a ball thrown into the air falls straight down (and the subsequent attachment to this belief) held back progress in astronomy. One big scientific idea that was gained from Aristotle was to search for the cause of things.

By Plato's time, facts were known that should lead someone to our current model of the solar system. The models created by Pythagoras, Aristotle, Herakleides, and others were decent attempts at saving the appearances. However, the ball really got rolling with Aristarchus, who knew that the sun was at the center of the solar system, and that the planets revolved around it in circular motions. Unfortunately, everyone was too blinded

by Aristotle to notice. It would have to be left to Copernicus to point out that we do not observe stellar parallax because the stars are indeed extremely far away.

Aristotle essentially invented logic. The reason logic was so powerful was that it "guaranteed" truth, which was something people had not found from any other source. As a rule, one can say that deductive logic proceeds from the universal to the particular, while inductive logic proceeds from particulars to a universal. Logic, however, is not infallible. If one begins with premises that are false, then the conclusion is not guaranteed to be true. Aristotle did not use induction as much as he did deduction, although it may have been helpful, given his interest in classifying things.

The west had very little original Greek work until around 1085, when the Christians conquered Toledo. After that event, there was a virtual "Aristotelian explosion" (rivaling the Latin explosion headed by Ricky Martin many years later). People embraced logic and started to question The Church. At the same time, revolution was taking place in the world of architecture. Through what came to be called Gothic construction, windows were allowed in churches due to buttresses. Byzantine art was reminiscent of Egyptian art in its formulaic nature.

Roger Bacon was a hero of experimentation. He stressed the importance of experience and mathematics, and paid the price. Out of the people we have discussed thus far, his thoughts on what science should be are most near those of what most scientists hold today.