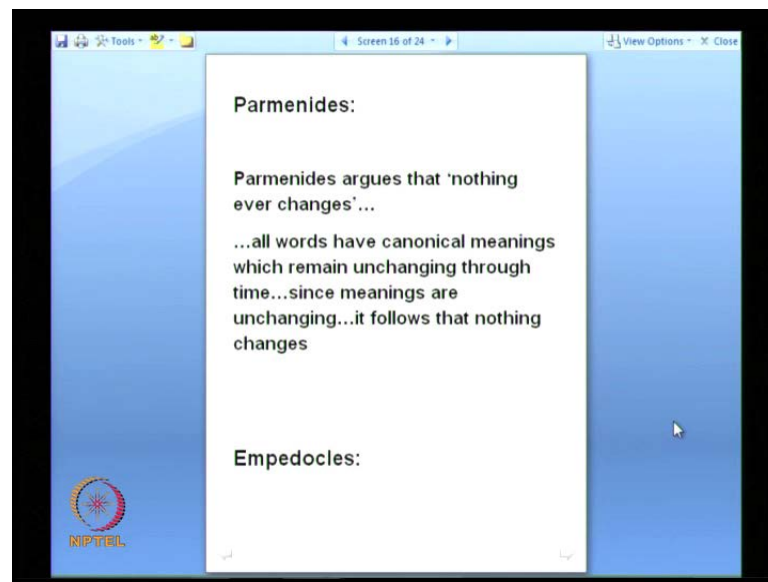


History of Economic Theory
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Lecture No. # 06
From Parmenides to the atomists

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Parmenides which you can see argued that nothing ever changes. Now, you can look at this either as an empirical proposition or as a logical proposition. Empirically from the world of senses, from the world of experience, it is not possible to say that nothing ever changes, because empirically what Heraclitus said seems to be closer to truth from the world of experience, because experience keeps changing all the time.

So, what does Parmenides mean? When he says, nothing ever changes. The proof or the argument is not empirical, but logical. It goes something like this. Suppose, we are talking about somebody Mahatma Gandhi right just say somebody Mahatma Gandhi. Is Mahatma Gandhi a part of the present? People will say no, he is only the part of the past, he died.

Can we talk of somebody who will be Mahatma Gandhi's great, great, great, great grandchild? That is a matter of future. Can we talk about the future when we are in the present? Again pretty much not possible. So, we have the distinction of time and space which seems to interfere with our perception of things and alter the perception of things. If able to say Mahatma Gandhi immediately there is evoked in you a feeling that something is happened and gone which is where we are talking of Mahatma Gandhi. If I am talking to going to talk to you about a name which you have not heard of at all then you will say it does not belong to now, it is not part what we have here.

So, whether something is here or there or ever seems to be from the world of senses constrained and bound by the idea of time. Is it present? Is it past? Is it future? This seems to be the question which seems to formulate to us the idea of what is am I saying it right, do you want me to say it again? Yes, can I go on. So, Parmenides found that our perception, our understanding of things is incomplete as long as such a perception and understanding is conveyed to us by the limitation of time, the awareness of the present versus past versus future.

So, he looks at something further deeper and says when I say something when I say Mahatma Gandhi am I talking of something which is gone, did and gone. No, because people are still talking of Mahatma Gandhi. So, Mahatma Gandhi is dead and gone, but people are still talking of Mahatma Gandhi. There is a meaning which he makes to them today and there is a meaning which he will make to people 2 years from now. In other words when people talked of Mahatma Gandhi just because of Mahatma Gandhi passed away 50 years ago, It does not mean that Mahatma Gandhi is a void, it does not mean he is nothing. No, Mahatma Gandhi makes a meaning today, he makes one meaning to people today, he made one meaning to people 50 years ago, he made he will make one meaning to people in the future.

So, he goes on to say therefore, Mahatma Gandhi is changeless. He is there in the past, he is there today, he will be there in the future. As long as there is somebody who remembers to refer to Mahatma Gandhi, it means Mahatma Gandhi has a meaning. It might be a time and a place where nobody might may have a reference to Mahatma Gandhi at all, they might not have heard of that word at all, in that place he has no meaning. So, what is important then is to understand that whether we whether we

perceive the meaning in Mahatma Gandhi or not is only a matter of how time influences us, but the meaning itself does not change.

If I am talking of Mahatma Gandhi here I understand him one way, if I am talking of Mahatma Gandhi in Gujarat I am understanding him in another way. In other words what he is saying is meanings do not change, but the way you perceive meanings is subject to the influence of time and space, makes sense. So, Parmenides says nothing ever changes, change is only superficial. I want to write this term. So, Parmenides had a strong case to make against the idea of the void. So, he says you say that void is a thing, but nothing there is, nothing that isn't can exist and therefore, there is no such thing as void. Look at the fine play of logic here. He says you say that void is a thing but, nothing that isn't can exist therefore, there is no void. He is playing with words you know but, the point is very clearly made.

He is opposed to the idea of void and along with Parmenides begins this big debate in Greece should I accept the theory of void, should I accept the theory of the plenum, *plenum* which is which means the world is full of, there is no empty space, the world is full *plenum*. So, the debate was, was it a plenum, was it a void, if it is a plenum the world is full of this 1 thing, if it is void there is really nothing. This argument which Parmenides made against the void as in aside we can look at the way a zen buddhists might have answered that.

If you remember in the last class we saw that the buddhists were talking of *sunyavada*, they were talking a void too and the zen buddhists of japan are direct descendants of the school of buddhism *madhyamika* and the zen buddhists are looking at this void as a no thing. It is not nothing because you do not know anything about it. It is a no thing, you cannot say it 0, you cannot say it is void, you cannot say anything.

So, zen buddhist found a nice explanation for the void which answers what Parmenides said. Parmenides made a play with the word know void means nothing. So, he says its void is a thing and then you say then he says nothing which isn't can exist and therefore, void does not exist. Buddhist will say we escape from this whole play of words by simply saying there is no nothing, there is no thing, there is only there is no thing. That no thing is again what Buddha was talking about when he used a similar term, he never used any description for any permanent eternal principle, he never talked about it. So, by

that token everybody thought Buddha was an atheist. True, he did not accept any form of organized religion and worship.

But does it mean that Buddha denied that the world was a plenum. Nobody knows because Buddha never said sunya, Buddha never said sunyata which his disciples said. Buddha used the word thathatha, have you heard of that expression thathatha, thatha in hindi in sanskrit it means what? That thatha he said thathatha is thatness, Buddha would only say thatness, he says I cannot say anything more. I cannot even say it is it, I cannot even say there is something but, he says if you go through the process of quantaplantation and removing conditioning from your mind one after another after another then you get to a point we need simply that. So, he says thathatha.

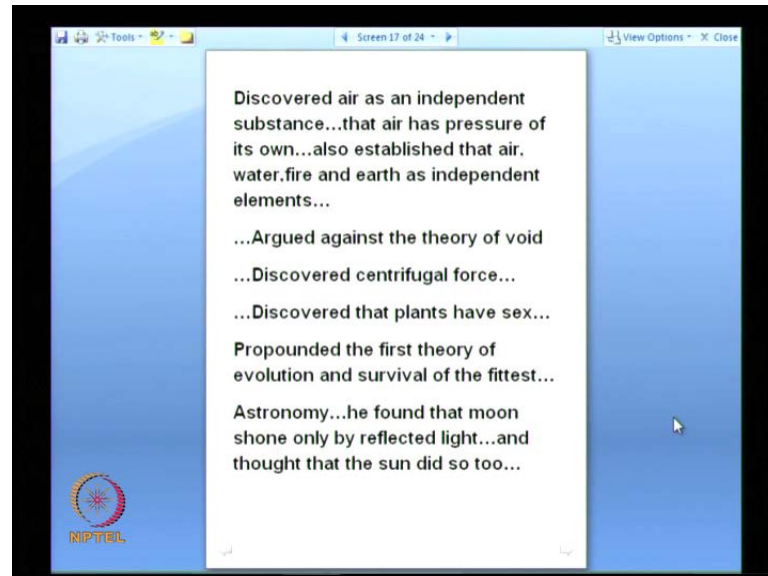
So, Buddha was one step further than all this. He did not say there was void, there was plenum. No, he accepted neither he says there is thatha. So, which is why the Buddha's were referred to in buddhist terminology was thatagata, thatha gata that means people who were in the state of thatness. So, any way this is a little aside we went into buddhism because it triggers a nice little thought on a parallel line. Take another step beyond this, you find on the story of buddhism centuries after Buddha there was a man called Goudapada. Goudapada decided that he would write a summary of the different darshanas and different experiences of people. He started looking for it, he finds at his time there were 28 types of darshanas, sankya, memumsa and so on and so forth. In which buddhism was one of the darshanas.

He answered writing so much on darshanas then later day philosophers who were trying to find out what Goudapada really was. Large number of them said Goudapada is actually a fine buddhist who does not acknowledge he is a buddhist because his arguments are so pronagarjuna, but there are whole lot of others who are upset by this because Goudapada was referred to as paramachrya by none other than Adishankara. Adishankara's guru was Goudapada's student.

So, eventually Adishankara went on to formulate a system which included you know bajagovindam, it included soundarya laheri, shivanand laheri all on gods. The point I am making is this, issue of plenum versus void has such ramification, such implications. If you just take it across the planet Earth from Greece onto the Indian subcontinent you really find that there is no resolution to this problem of whether something is a plenum,

something is void. But at this point in time Parmenides clearly argued by simply playing with words that void does not exist, that means this world is not a void.

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Now, Parmenides is followed in our list by Empedocles who is not a mystic, on whom the orphic cults made no impact, on him on whom theory of reincarnation had no meaning. In fact, he was an empiricist. He said if you took a vessel, empty vessel, inverted it and put it into water. Water does not get into it even if it is empty. He says it contains something inside which was preventing the water from going in. So, for the first time in the history of science somebody proved that there is an independent substance called air.

He proved it, not only did he prove that there was an independent substance called air he also proved by that token water is an independent substance too because air and water keep each other away from that vessel which is inverted. Now, when the vessel inverted is turned a little bit then air water enters it, evicts air so which means in their natural state air and water must be independent substances. So, he goes on to say not only air, water, fire, earth they are all independent substances for the first time and for the first time he is talking about air, water, fire and earth in scientific terms not like Thales and Anaximander and others who were talking about more philosophical speculation. This whole world is water why because we are surrounded by water.

Whereas Empedocles could say no this vessel contains air because it is not letting water into it. So, the perception was different, the perception was more scientific in the modern sense of the world and Empedocles clearly argued against the theory of void. He says when you have all these substances independent if you have air, you have water, how can you talk of void? How can there be nothing? He simply dismissed the haraclatin idea of a void, totally dismissed it.

And then he also discovered the idea of a centrifugal force. He says if you take water in a vessel, in a cup, tie a string to the cup and spin it around you, the water in the cup will never spill. Why because it is in the edge of the cup on the side of the cup pressing against the side of the cup and its being prevented from getting thrown out. So, for the first time somebody discovers what today is called the centrifugal force. So, hat Empedocles was the person who discovered it and more important Empedocles discovered that plants have sex, there are male plants, there female plants for the first time.

So, you can see how profound this man's mind was long before scientists were talking about the process of pollination among plants, this man understood that plants have sexes, there are male plants, there are female plants which result in the propagation of plant life and the earliest known theory of evolution is also propounded by Empedocles, he is not like Darwin, but he says that in the past the world was full of all kinds of mermaids of creatures. He talks of creatures with 10 heads and 15 arms and so on and so forth and not all of them they were competing on this planet for survival and he found not all of them were fit for survival. So, one by one the one's unfit for survival, those species died out and the others came and he says human beings have survived because they are most fit than other older species.

So, here is a first known articulation of the theory of evolution. Once again Empedocles is talking about, do you want to write some of these down. And then Empedocles also knew that the moon was not self-luminescent, he knew that the moon was only reflecting sun's light for the first time and he also thought the sun itself is reflecting some other light where of course, he was not right correct, but the idea that what you see in the sky as light coming from bodies of planets in the sky that that light could be reflected light and not light of their own luminance's of their own was a first time that he supported in

the moon and thought it should be the case with the sun also can be quite simply forgiven by the fact of the profundity of this realization.

He also understood the cause of eclipses, the cause of eclipses that the moon intercedes between the sun and the earth and casts a shadow on the sun and thereby there is a solar eclipse. Perhaps, he learnt it from a contemporary an exiguous who talked a lot more on astronomy then hit, but whatever he was able to articulate it and most important and finally, he was an excellent physician. The excellent knowledge of human anatomy. So, he founded the Italian school of medicine which became so popular and lasted such a long while that all 3 Socrates, Plato and Aristotal were all influenced strongly by the knowledge which they picked up from the Italian school of medicine.

But most important Empedocles did not believe in any kind of monism. He did not believe either in the theory of void or in the theory of monism. For the first time he articulated a point of view which is purely modern in his quality. He said life was governed by chance and necessity, it was not governed by any teleology, it is not governed by any cosmic force, it was not governed by any factor which was not explainable, he says no life has governed by chance and necessity. What happened could be explain explained in terms of necessities in the lives of people, necessities in nature and more importantly happenings which were due to chance, to accept the random as a random and not throw it into the explanation of monastic causes was the first and fore most attempt here.

There was no teleology in his writing there was no original purpose or original cause, there was only chance and necessity which governed life and therefore, there was no void either. Perhaps the Greek scientific mind really excelled itself when it found itself in people, people like Empedocles. Let us now look at Anaxagoras. Anaxagoras also is opposed to the theory of void. Anaxagoras was also scientific in the sense that he was trying to talk about cosmos. He was trying to cosmos, he was trying to talk about life from the point of view of what he thought was his awareness, his understanding of life around him.

So, he could not accept the theory of void for the simple reason that he said no void when life is full of all kinds of forces, all kinds things. He did not he did not really go into the debate of monism versus void, he didnt become a monist either. He was all the

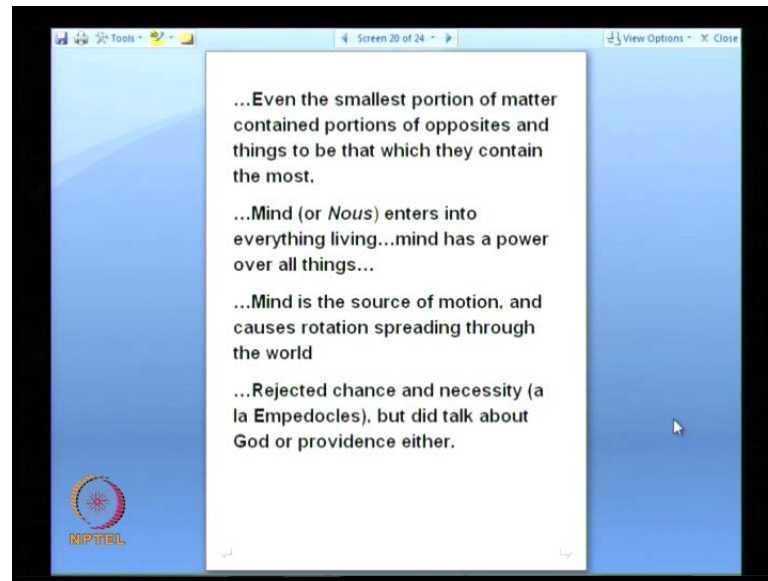
time empirical, for instance he saw he thought that sun is a red hot stone. It is a huge massive stone which is red hot which is why he says during dusk and dawn you can see it its original colour which is red and moon itself was nothing other than a planet like earth.

So, his view of the planetary system irritated the religious fanatics of his time so much that he had to flee, he had to leave, but he was such a dedicated teacher that he went back to Ionia from where he came setup a school there and he was so dedicated that he wrote a will in which only one thing figured. He said after I am dead each of the days when your celebrating my anniversary, it should be a holiday for children because the children must play. So, that was how Anaxagoras's life ended.

What is important in his findings is, his he revives the idea of balance with the Milesians hand, he accepts what Heraclitus says that things contain opposites within themselves, but he talks of the opposites has being in a constant state of balance and for the first time in Greek philosophy, we find somebody talking about the mind. The mind as being all important *nova*, *nous*, the *nous* enters subsequently into large number of debates in Greece whether there is such a thing whether there isn't such a thing, but he is the first 1 who brings into western philosophy the idea of an independent mind.

In later times there was a lot of debate about whether mind and matter are independent from each other, but this was the first articulation by anybody in west that the mind is independent, not only independent, it permeates everything it controls and reigns over everything.

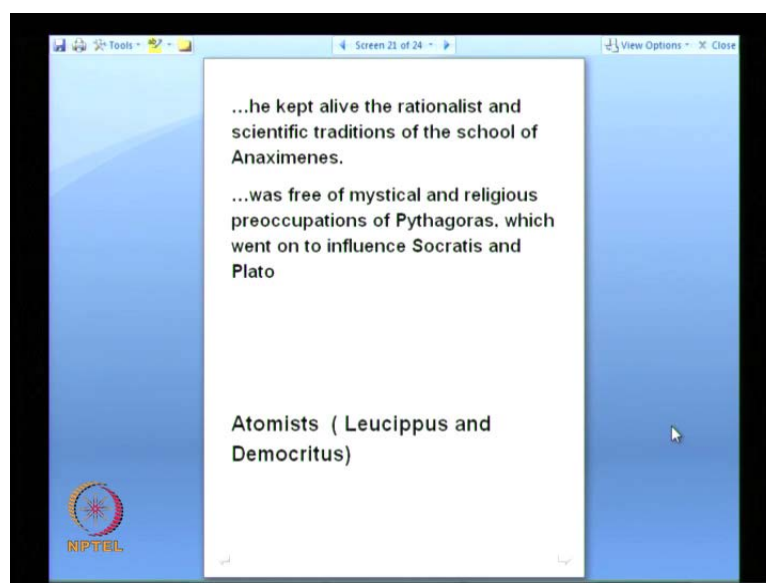
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And to the mind is responsible for all motion. And he also says that the mind causes rotations in the planet which tend to move like waves in a pond when you drop a stone in them, the rings of waves move in the same way the mind can be in one place and cause rotations in the planet. So what he means by rotations in the planet we do not know, but certainly he is talking of some kind of field of energy which the mind can control, that much can we understand. In Anaxagoras, you find great pragmatism. He rejects the theory of void at the same time he does not talk of any kind of monistic principle. He does not think in terms of anything which is original cause, he does not think of anything which is the end purpose of all existence in other words he is not a theist in that sense, he is pragmatic.

According to laterally I think particularly Plato and Aristotle they thought Anaxagoras was an incomplete thinker because they both thought if he had gone to the point of specifying the existence of nous the mind then he makes no use of this discovery and to show how this dominates everything, how it controls, it permits he does not say anything. So, they say he is an incomplete thinker. So, Anaxagoras was not as profound as a celebrity thinker as others were, but you can say very clearly that he represents the spirit of scientific enquiry in the sense that he will not commit himself to either void or monism for the simple reason that he does not have enough basis to argue either. So, this method of reasoning is what qualifies him as a very powerful, very significant.

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Let us just go on to the last of the list which I was thinking of which are the atomists. Leucippus and Democritus, they are both attributed the status of having founded the school of atomists. In a sense it is true, but they spoke differently in different places, they live separately in different places, they did not constitute a single school of thought as it were. The atomists were called atomists because they believe that everything was composed of atoms and they believe that they were physically indivisible units of this universe which were impenetrable and imperishable and varied in shape and weight, which basically means that they were thinking of atoms as a basic building block of the universe precisely as modern nuclear physicists are talking about.

It also means that they were thinking in terms of a via media between the monists and those who were talking of the void. In fact, Battin Trasel argues that the atomists were saying what they did basically if they wanted to because if they wanted to find the middle ground between people like Heraclitus on the one hand and people like Parmenides on the other. They could not accept the fact is they could not accept the world as a void, they could not again accept the determinism of a single original cause and the single purpose for all life.

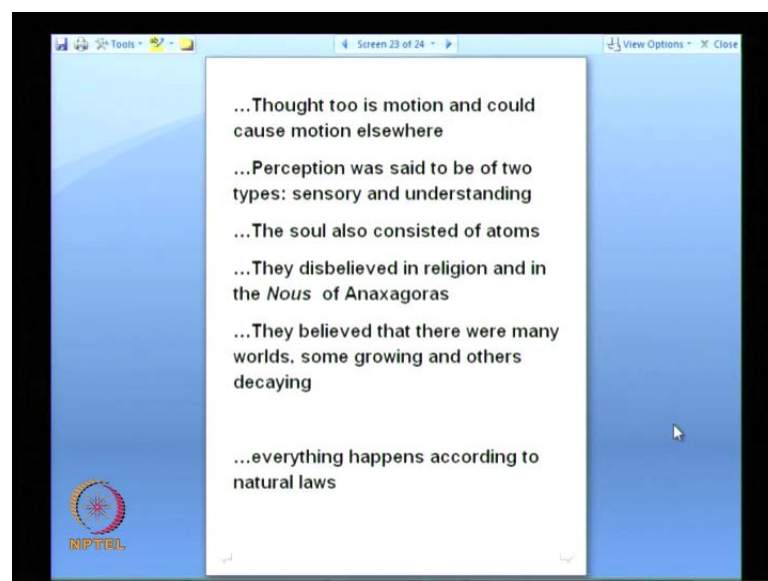
So, in this quest of trying to find a middle ground according to Battin Trasel the atomists went about finding whatever they did which was so astonishing. According to them not only that there are atoms which are indivisible physically and which are many shaped,

many sized but, these atoms are always in motion and in that process they clash with each other, they combine they change morphology they change the shapes of each other and what is most important atoms are impenetrable and finally, atoms could do all those moving around because there is space between the atoms. Otherwise, why could they move in a plenum nothing can move because its packed, know plenum is full. It is packed, if all the seats in this room are full who could move around from one seat to another.

So, atoms could move because there is space between them and motion became possible, but atoms themselves where impenetrable, they cannot be cut open to and divided to see what they were inside. See, a lovely via media was provided here between the voidists and the monists. The voidists could see in this system that there is space between the atoms so there is void, but at the same time the atoms themselves were ultimate particles which could not be further reduced or penetrated or cut. So, the monists were satisfied that these were the single determinants at the same time they ended up constituting an entirely different way of looking at this universe.

So, perhaps not just philosophically, but scientifically the atomists took the biggest leap forward among the Greeks.

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Not only this, but in terms of thought you remember Anaxagoras was talking about mind nous the atomists did not accept anything like nous, but they accepted thought, they

accepted that thought is very physical, it is not a product of some invisible thing called nous, they said it is a physical process thought happens because there are atomic movements and two types of perceptions they distinguish very nicely, they said 1 perception which through the senses and another perception which you can deduce, reason out which is an understanding. You can perceive two chalk pieces and say here are two chalk pieces. That is from the senses.

But you understand that there are two chalk pieces because you see 1 and see you see another and you reason out that 1 plus 1 must make 2. So, the 2 types of perception are significant. In the understanding type of perception, it depends on sense because you have to perceive the two chalk pieces. So all understanding it depends upon sense perception, but sense perception is dependent on external factors whether there is enough light in this room, can I see the chalk pieces or whether there is something blurred in my vision or something which blurs my vision so I see two chalk pieces as 3 chalk pieces. In other words sense perception can lead to false hood; sense perception can lead to mistakes

So, while thought is said to be very important at the same time they mistrusted the senses because the senses could mislead. The atomists also believed that there are certainly this world which we live, but this reflects the existence of many other worlds and that it was possible to find life on some of these other worlds. Most important the atomists believed neither in the nous nor in any monistic principle nor in the theory of void and they were the first ones to articulate the idea of natural laws, everything that happens on the planet happens only according to natural laws, nothing else. So, with the atomists we find the whole development of scientific and speculative thinking of the Greeks taking a very definitive form.

Atleast a state where it could start leading to growth and thinking in the times to come, having said this it is also a fact that as buttin rasel says beyond the atomists you find that the greek thought is dominated by Socrates, by Plato and Aristotle. All of whom where confounding themselves with some kind of mystical beliefs. They all found the carry over in themselves of the original mythological believes in different forms, the orphic believes carried themselves into pythagorean system. So, despite all the geometry and mathematics and deductive thinking in the pythagorean system at the heart of it, all where the orphic belief in the existence of a transmigrating soul; this influence lasted

deep into the thinking of both not only both, all of Socrates, Plato and Aristotle and in this sense once again Greek philosophy became subject to faith rather than reasoning.

In Plato you find a strange mixture. In fact in all three you find a strange mixture of reasoning constantly trying to bolster up something which is in article of faith. We will talk about Plato, Socrates and Aristotle in the next class, but this is an important thing, at the bottom in all 3 minds there is faith, there is a monistic faith and all the reason and all the reasoning is used by this people to support and strengthen and bolster this faith. In a sense battin rasel seems to hit the nail on the head when he says Plato was not a genuine thinker. He compares them to people like Empedocles, people like the atomists who stake their faith in reason, stake their faith in what Pythagoras called the geometric method and went only by it and stopped where he stopped he did not go beyond into speculate into faith.

So, russell feels that the great growth of scientific thinking ended with the atomists and then came the classic period when all the great Socrate's and Plato's and Aristotle's came he said by enlarge this was a false period where faith dominated reasoning. Having said that let me also go one step further to say this is a very important feature of western thinking, articulating something which is first and foremost a profound article of faith and then using reason as a very powerful tool all the time to prove what is a matter of faith. The whole of the history of Christianity from a couple of centuries after Christ onwards right up to the time of 16 century when dekart was writing developed this street that you must sine you can sine you can reasonably or rationally establish something which the Christian faith is talking about.

So, whole lot of theological debates occurs in this period, where reason is used continuously to debate something which only faith can show. So, you have among the scholastic, whom we will talk about. This continuous attempt to use reason has a hand tool of faith, this what resel meant when he said that the great eclipse happened after the atomists in Greece. Even dekart you find this over odd. I would not say dekart is full of fear, we will talk about dekart later, but dekart is driven in 2 by the Christian in himself as believing Christian and the incredible mathematical philosopher in himself. So, that he is using proofs. He is trying to establish the proofs of god using methods which were as old as scholastic centuries before him.

So, this is an old thing in the west. Trying to start with a faith and using reason to support what is a matter of faith, it goes right through the history of Christianity. It comes right through after the time of dekart why if Galileo Galileo make such incredible astronomical statements, but he had to recant otherwise he would have been persecuted and killed, he recanted and said no I dint mean what I said so this was the power of faith which ruled the west. Eventually, you would find that the whole thing ends first in the reformation of the church itself reason creates different churches and then finally, you find that religion itself slowly lapses and gives way to the age of enlightenment in the seventieth and eightieth centuries when this old habit of first believing and then using reason to support your belief slowly dies down, but that is the story which we are going to study in the times to come.

At this point and time, I shall say that we done with the Greeks. The purpose of looking at the Greeks was to understand the reasons why people were looking for universals. We found that it could be faith, it could be reason, and we found that all the processes of reason which looked for universal lead to modern science and economics is a science. And we found that in the way they were processes which lead to looking for universals on faith. And therefore, what universals people actually articulated, this we can say clearly depended upon the conditions and contexts in which they lived. Copernicus was not persecuted, but Galileo was afraid of being persecuted, Giordano Bruno was persecuted. So, the conditions under which people could speak a proposition of reason fearlessly or whether they were hesitant, whether they were curbed nobody could say, but this is for us to see in the classes to come. Have a good evening.