

History of Economic Theory
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Module No. # 01

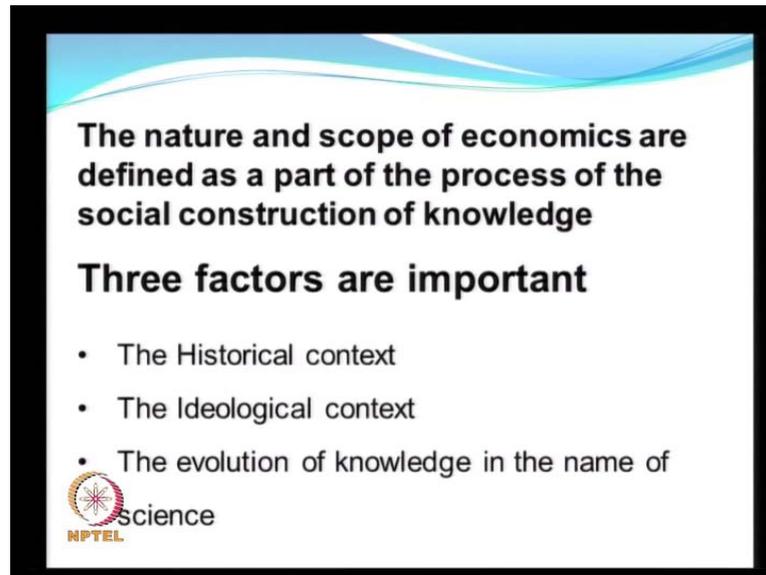
Lecture No. # 35

The Social Construction of knowledge: Case of Economics

It is our concluding lecture today and in a sense it will be like end of resume of all that we have done in this program so far. In a sense we shall look back at what we have done in term of understanding the definition of the universals in the name of economics since a time of Greeks and right up to modernity into evolutionary economics. We have noticed that each time we talked about a particular kind of economics, whether it is Aristotle whether it is Scholastics, whether it is Mercantilists, whether it is Physiocrats whether it is Smith and so on and so forth right up to the time well past neo-classical economics through Keynes into institutional and evolutionary economics.

Each of these occasions economic seems to acquire a different meaning in terms of the universals (()). Each of the times the subject seems to have a different scope the subject seems to have a different coverage and more importantly the meanings, of economic process is acquired different interpretations, in each of these points of view. This is in a sense what we are going to study today, to try and understand the process through which a different points in time knowledge acquires different meanings and how such meanings, are constructed in society. And we shall look at the construction of knowledge in economics as a part and parcel of this process.

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The nature and scope of economics are defined as a part of the process of the social construction of knowledge

Three factors are important

- The Historical context
- The Ideological context
- The evolution of knowledge in the name of science

 science

There are three things which are very important in order to understand this one there is always a historical context for construction of knowledge. In other words knowledge always gets constructed at particular points of time in particular places, there is no such thing as knowledge, which is constructed in abstraction as if it drops out of the sky. I am saying this, because there are two very distinct views in human history about knowledge. Post enlightenment and pre enlightenment we know that enlightenment happened around sixteen, seventeen, eighteen century, particularly seventeenth and eighteenth century. We know that there was a fundamental transformation or the way people looked at knowledge from the time of enlightenment onwards.

From the time, from the time of enlightenment it seemed very clear that knowledge was something which was created by human beings and could be constructed and could be understood by the power of reason. Whereas, prior to enlightenment knowledge was virtually, the monopoly of the theologians of the church. In the rest of the world when we are talking about say knowledge in a similar context enlightenment does not have a specific historical significance. But in many of the erstwhile colonial countries which became independent in the 1950's and 60's something like enlightenment occurred with the advent of modernity. A lot of things that happened in Europe during enlightenment happened in these countries, with tremendous speed after their independence with the advent of modernity.

So, we can look up on these countries to as pre independent and post independent again the divide is clear. So, as I said the way society constructed knowledge and understood what knowledge was differed pre enlightenment vis a vis post enlightenment. And within pre and post enlightenment we find through our own study of economics again there are different points of time where historical context has different meanings in the construction and creation of knowledge. For example, when we are talking about the time of the Greeks we know that universals were looked upon from two points of view and this is a duality in the construction of knowledge by society. Which persists right up to the end of the scholastics right up to fourteen fifteen century what is the duality, from one point of view knowledge of universals was an object of faith.

For example, long before Aristotle there was the idea of promethean cults, where Dionysus was said to have been born to the god Zeus he was torn apart by some creatures who were half human and consumed. And the myth of Dionysus assumed that he was reborn partly as divine partly as mortal and the whole followers of the worship and followers and worshipers of the in the cult of Dionysus. Sincerely believed that part taking flush of animals sacrificed in a sacrificial ritual was part taking the flesh of Dionysus and therefore, acquiring or reaffirming their own divinity now mind you it is from here as we saw that the Christian myth carries over of the blood and flesh of Christ. Part taking in I think it is called communion a little biscuit and a little sip of wine nailing before the priest he ritually offers you the flesh and blood of Christ.

Now, this myth goes back as I said to some three four hundred years before Christ to the myth of Dionysus in the in the in this myth. Now, the reason I am taking about this is that about this time in the life of Greeks. The universals of the world were defined partly in terms of faith and the at the same time the Greek mind was enquiring, they were looking at the (()) what is the universe composed of is it composed of air is it composed of earth it is composed of light is it composed of heat there were asking these questions too. So, they were asking very physical speculative questions about the universal, at the same time they were parallely running articles of faith about what the universals were all about.

We saw that there were two different compulsions for these universals not just at the time of Greeks, but at the time of all humanity. Existence of uncertainty in existence looks upon people to look pushes people to look upon or look for some unchanging

eternals, which are not subject to uncertainty. And has if you remember this act of sheer brilliance happens in all civilizations at some point where, the tremendous uncertainty which you are faced with as a civilization as a society as a culture is at some point converted into perfect certainty. You say everything is the act of god and god is immutable eternal permanent always indestructible which means, it is eternity perfect certainty.

So, attribute to the will of a perfectly certain principle all the uncertainties. So, in this brilliant conversion psychological conversion of uncertainty, eternally facing uncertainty into perfect certainty lies the birth of all faiths sociologically. There are various other dimensions to faith too, but from a social psychological point of view we have seen that this is a crucial point at of departure in the emergence of civilizations. Whatever, in the Greeks you find the existence of these two parallel, universals occurring through faith and universals constantly coming up through the spirit of enquiry and speculation.

Eventually, the spirit of enquiry and speculation acquires it is own peak at the time of Pythagoras and his followers were mathematics acquires a very unique significance. Where astronomy and the study of physical phenomena acquires very very special significance as a very permanent as a very permanent as a very well directed line of enquiry, but subsequently with the coming into existence of Plato and then Aristotle. Once again this speculative enquiring line of thought in a measure gets subsumed under faith once again. Whatever, we find the parallel existence of these two and that is the uniqueness of the historical epoch of the Greeks.

After Greeks you find certainly by the fifth century and by the time of people like Saint Jerome in church, while Saint Jerome and the great four saints of that time, you can include all four of them in this by that time all knowledge is taken as a proprietary property of church. Church has the soul monopoly over construction of knowledge on behalf those of the society. Therefore, any attempt by any member outside of the church any secular attempt to of for constructive of knowledge is by very definition heresy and therefore, not condonable. Now, this approach continues right up to the time of thirteen fourteen fifteen century right up to saint Thomas Aquinas, who tries to restore some credibility to the secular aspects of knowledge by acknowledging that there are not there is knowledge, which is only revealed, but there is also knowledge which is perceived and studied through the census.

So, Saint Thomas makes this distinction and gives credibility to the secular sources of knowledge that is scholasticism. So, we find that economic ideas from the time of Aristotle right up to scholastics. There is a constant in the sense that the basic preoccupation of knowledge is theology and right up to saint Thomas Aquinas that is the case. And so, you have very many moral judgmental aspects about economics which are part of theology for instance looking down upon usury money lending. From the time of Aristotle right up to saint Thomas Aquinas usury is not tolerated money lending is considered fundamentally exploitative. As compared to working on a farm or manufacturing something, this is a kind of moral bases of looking at economic activities which is part of the era of faith.

However, you find by the time of the sixteenth century a dramatic change is happening in society as the church is no longer in control of the monopoly of knowledge universities and such other bodies of knowledge are growing very fast. Second the interest groups in society suddenly transform no longer is the society dominated by land owners and the king or monarch it is not a rural aristocracy dominated society. The urban based merchant class trading class acquires tremendous significance as a result of the great commercial revolution that has taken place by then. So, the dominant interest in society now is that of the trading and the merchant class and the interest of monarchs being essentially political, because there they are the political heads of society.

The interest of the merchant class the mercantile class is now supported by the kings too. Then comes the whole school of thought or rather schools of thought which get designated in the mercantilism. Where the interest of these societies is same as the interest of the state and the interest of the state is identified with the interest of a single class of people merchants. So, here is another epoch where things have changed particularly economics get liberated get's liberated for the first time from its theological boundaries.

Suddenly economics get get's looked at as if it is the state that mattered and if the state was what mattered it is a power of the economy that mattered. And when power of economy is what matters, then it is the strength of the mercantile class that matters in short you have the first organized school of economic thought coming then on its own on its own steam as it were the mercantilist ideas. By the time you reach eighteenth century society has gone through further transformation the nation state has come into

existence. The mercantile class has grown in strength and is now diversifying itself into an industrial class in England and Scotland and in the rest of Europe slightly later there is great growth in the country side in the name of agrarian revolution.

New seeds are invented new techniques are invented new methods of crop rotation are invented in short there is a big revolution going on in agriculture over the eighteenth century. So, all this creates a new environment of who is prosperous whose interests are involved in the economy more importantly the idea of prosperity acquires an importance by itself more than the interest of the merchants more than the interest of anybody, but a prosperous nation becomes a single important desideratum. So, in this historical epoch you find first the rise of the physiocrats who identify prosperity with the prosperity of agriculture and with the prosperity of the landed class who depend on agriculture.

And subsequently or even during the time of the physiocrats the first significant economic principle comes into play namely in order that society and its different classes are able to subsist somebody whose productive has to generate a surplus. For instance for landlords to subsist there has to be a surplus from somewhere which enables them to subsist and in fact the physiocrats thought even all traders and merchants and artisans were also sterile they did not they were not productive. So, even for them to subsist the surplus had to come from somewhere and in the physiocrats reckoning the surplus came from land.

So, they were very concerned about the circulation of product from agriculture to the rest of the economy and back. So, early rudiments of economic theory come into existence during the time of physiocrats again significance of the historical period. We do not have to emphasize this further when we go past towards the end of eighteenth century and through into the nineteenth century. When the subject of economic blooms and blooms through the writings of through the writings of first myth then say and Ricardo and Malthus and Mill and so forth Jevon Menger Walras nineteenth century is the period of boom of economic theory. And the boom of economic theory not coincidentally occurs with the boom of capitalist industrialism.

And the apogee of this boom in economic theory is the advent of neo classical economics and it is also the apogee of the supreme faith in individualism and in the faith in the invisible hand which working through individual choices is able to allocate resources

most efficiently. So, the invisible hand which originates since Smith in seventeen seventy six reaches its culmination in Marshall in the early part of twentieth century. Where partial equilibrium analysis exemplifies the merits of free competitive laissez faire economy and then of course, comes the crisis of capitalism not in the way Marx was talking about it.

But in the way in which Europe experienced it in the nineteen twenties and thirties and it was discovered once again through another in another historical epoch that was the epoch of Keynes that laissez faire is it not all that great it does not seem to deliver the goods and the kind of situation, which says law is talking about is notional. It does not have to exist in reality and to create a convergence between the efficiency of a system in say's law and the normal efficiency of an economy which is not reaching full employment the state comes in very importantly as not just a nursemaid, but an important intervenor in the system.

So, this is another historical epoch this you can say is the peak of liberal European states. We will stop about historical epochs at this point and going to the next thing which is of importance namely the importance of the ideological context. We have already seen the importance of ideological context partly when we are looking at historical epochs, because the way we discussed historical epochs is also the way we discussed ideologies. What is crucial is to understand that economic ideas do not float independently in society, they are part of the way ideas are created and they float around in society.

Once again if you look at Aristotle, Aristotle's ideas of economics were only pertaining to the household Aristotle thought economics was a matter for the household to be concerned with not for statesmen and kings in other words he was not thinking of macroeconomics. He was not even thinking of microeconomics, because he thought trading is very bad they thought trading is an unethical activity, any profits made out of exchange as opposed to profits made out of manufacturing was immoral. And so the ideological universe was very significant in the way people looked at economic processes.

So, in Aristotle's times morality social morality were something under which all understanding of economics was subsumed and as we saw this persists right up to the time of scholastics and culminates in Saint Thomas Aquinas. In other words we are

thinking in terms of a moment from something like three hundred b c to something like fourteenth century in a turn of thousand seven hundred years of domination of the morality of the society over how people made money and how people used it this is how powerful the world of ideology was. Then once again when you talk of mercantilism that is a very big ideology in other words the interest of the economies was the interest of the state and the interest for the state was no different from the interest of the mercantile class.

Here again new ideology is born which is secular, which is not moralizing in terms of theology and religion, but which identifies the well being of society with the well being of one class this is the beginning of the economics of capitalism. Which all modern economics is in short it is not just the mercantilists who identified the well being of the economy with the well being of the mercantile class. But all other schools are taught subsequently barring physiocrats, either positively or negatively identified economics with a well being of a capitalist I am saying positively or negatively. Because through Smith and Ricardo and Malthus and Mill and Walras and Jevons and Menger and Marshall and so on and so forth.

All of them did not think once that you could have the welfare or the well being of the economy outside of the welfare or well being of the capitalist class. Negatively because a whole lot of protesting economics of the nineteenth century beginning with saint and so forth going right through up to Marx said yes modern economy is all obsessed with the capitalist, but they said it with bitterness with cynicism. And with dislike they said how the society would be something different with Marx it became a very idea of history. So, the ideology of Marxism was also an ideology of construction of knowledge in a very unique way and this idea of history of Marx gave him to believe that the form of capitalism was inevitable which was reflected in his economic analysis of capitalism. And eventually in the establishment of a socialist regime which he hoped would come into existence.

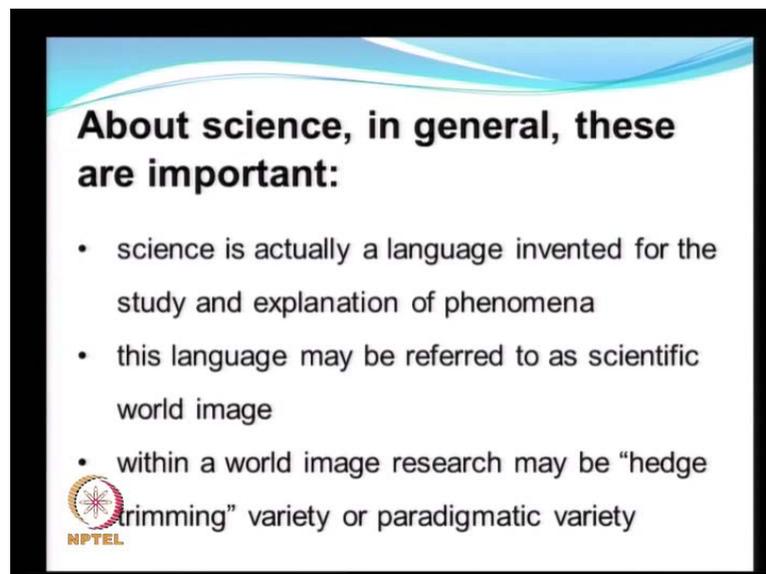
So, here again ideology comes in very significant all of nineteenth century the ideology of socialism the ideology of critic of capitalism is very dominant. The twentieth century you find two different ideologies dominating practical economics on the one hand a liberal ideology or a Keynesian ideology dominating the capitalist world and a clear socialist ideology dominating the world. As controlled by the Soviet Union from

nineteen twenty onwards. So, you have a socialist ideology capitalist ideology and there comes the modern practice of dividing the world into the first world and second world and people who are sort of calling and stumbling without belonging anywhere were the third world.

So, ideology becomes very central to the way knowledge is constructed and finally, the very process of evolution of knowledge in the name of a science look at the word evolution. We already know that evolution is a value loaded word we cannot any longer use evolution after studying evolutionary economics we cannot use the word evolution in a very benign fashion. There is a manner in which there seems to be some kind of a selection process going on in what bodies of knowledge come to dominate and what bodies of knowledge fall back into insignificance.

In other words the evolution of knowledge in the name of science the evolutionary and selective process in the name of science that itself becomes crucial in the understanding of the social construction of knowledge. Now, I can break for a few seconds or few minutes if you people have some questions and all this or remarks or comments on this none all right.

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About science, in general, these are important:

- science is actually a language invented for the study and explanation of phenomena
- this language may be referred to as scientific world image
- within a world image research may be "hedge trimming" variety or paradigmatic variety

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So, let us look at the third component at the evolution of the very specific knowledge called science and we say science is a very specific form of knowledge in order to understand this the best way is to work through stories and analogies. And the best

analogies for me to try and explain how the idea of the science called economics got constructed in my mind and it got constructed not at all in what would seem a logical way. It was a series of images which juxtaposed themselves one on top of another seem to make sense in some kind of an idea of coherence, which was not logical in any sense of the world. Prelate it I realized this is a way science is actually constructed there is no logic to it.

So, let us look at this a little bit you know when I was about ten years old I used to live in a small place called Coimbatore. It is not very important what happened in Coimbatore at that time, because Coimbatore like was like any other small town with schools one of which I attended. But what was interesting is that in Coimbatore at that time I presumed that still are businesses which were called sound service these sound services used to have a large number of forty five r p m can c d's know what is that records. And they used to have these players which played these records and amplifiers and in huge conical microphones.

They hired out the services of all this apparatus for innumerable occasions for the noise loving population of Coimbatore marriages, weddings, funerals somebody attains puberty somebody goes out of puberty. You name it protest, meetings, political meetings you want noise sound service will give it to you in unimaginably vast disable quantities. Now, lot of us grew up in that with that as a white noise it did not seem to make a difference to us, but what I was curious about was not how they made their business. But I used to at the age of ten stand looking fascinated at that spinning disk and I would say here is this bloody thing spinning this flat thing and somebody is just moving on it and that thing is producing music.

It was magic how come this something spinning and there is a needle going on it and that thing is booming genuine music it was not roaring and making crackling noises it was music. I always I was always fascinated so I used to sit and watch and the place where I used to sit and watch it most was also the place where I used to go and hire bicycles the place called Antony's cycle works. Who also, operated a sound service I remember and this man Antony was fascinated by my fascination with this thing so, he asked me what was I looking at he said I said oh Antony how does it produce all this.

So, Antony thought he was explaining things further to me, but actually he mystified me even more he said you know this box underneath the record that is where it is all happening. I did not know a ten year old mind with zero conception of technology I said oh my god there must be a genie inside, this is this thing going around it and that is the genie sitting inside converting everything into music. And occasionally what would happen is these records were faulty so, they go repeat themselves you know the same line and the song would happen again and again and again and to me that was the time when the genie went crazy you see it I said oh my god this bloody thing has gone crazy it is it is not working properly.

So, to me it was magic and I am for a long time I could not think of a music system or a sound service or all this social events when this things were used in the absence of an idea of an invisible genie which was doing this. I am saying this because some years later I had to shift to Delhi my father moved to Delhi and he said come and join me so, I left my grandparents house in Coimbatore and went to live in Delhi with my parents. I remember standing in that biting cold winters of Delhi, waiting for the school bus cheeks getting red and going shiver shiver at seven thirty or eight in the morning waiting for the bus. And there used to be an acacia tree where we waited for the bus dusty small leaves and what was an of interest to us was the fact that under the acacia tree.

There was a big hole through which hundreds if not thousands of black ants were trooping in and out in and out in and out I was fascinated. I said oh my god they are all the time moving they are all the time where are they going what are they doing. Now, about one and a half or two feet above these ants which were trooping in and out of the hole on the trunk of the acacia tree were resting some few dozen fat flies you know it was cold it was not warm enough for them to get up and fly. So, there was kind of waiting for the sun to come out and they were sitting there and occasionally a wandering ant would catch sight of these flies and then my god the war would start.

For in some manner unknown to me some signal would pass and all the other ants will charge up here and they would try to drag the ant flies down towards to hole. And the flies would take try would try to take off with half a dozen ants into and this would go on back and forth. I never discovered eventually who want this communal war, because always the school bus came and I had to go, but all this stayed in my mind, because the

genie of the music system the ants they all stayed in mind. Because the ants puzzle me in the same way as the music system puzzled me.

So, I said oh my god who control these ants they are not fighting with each other they are not you know they are working in great unison dragging the food into their hole they are not cannibalistic killing each other in the process of getting at the food there is order there is discipline there is some method in it. So, I said there must be something inside the ant in the ant hill sorry some creature who is a kind of general or a controller or a king ant, which regulated the whole thing. In my mind that king ant was something like the genie in the music system again a very complex well organized system regulated by some invisible force, which was impressive beyond my means to understand.

So, this went on about that time my family decided that I should join arts group in the school, it was a time my they have to make a choice whether I had to go to science or arts. They thought I was fit for arts they put me in arts group strangely the arts group consisted of my other things of higher mathematics, geography such as a non arts economics too my economics teacher was hard to emphasize he is a science not an arts so we had economics too.

Now, the economics teacher was a fascinating because he was probably the best thing I experienced in my life as a teacher of economics. He took great deal of trouble to explain to us very patiently the concepts in economics the way markets were organized, but my mind wandered. I could not understand for instance I can say (()) when somebody says I want a peanut or I want a [FL] or I want a glass of water or I want a motor bicycle I could understand that. But he could not understand what was meant by wants you see I could not understand the abstract idea that there were wants. I could always understand that somebody wanted something that I could understand, but wants when as an abstract idea I could not understand.

So, I did not know what to do, but that was the way it was slowly my mind started constructing meaning for economic concepts through the images which I had in my mind. I started imagining that wants were like those thousands of ants and the limited means to satisfy the ants were the few dozen flies which were sitting there. And the whole activity of the market was the active concerted activities of the ants are getting at

the flies. And the invisible hand of the market was nothing other than the general of or the controller of the ants they would take the food.

I always imagine they would take the food inside their big hole in the ground into some cabin and then place the food at the feet of some general or leader and stand like (()) scouts in order. So, that the leader allocated to them you have so much you have so much to me that was the order of the discipline of them that was the image of the discipline of the market. So, gradually when my teachers started talking more economics when he talked to us about the auctioneer in the walras in system I said the genie in the record player and the general of the ants and so on. Of course, later economics got constructed in a more complex fashion, but the point I am trying to make is whatever is doing was doing what everybody does from the primitive times to modern times.

Knowledge is constructed through groups of images in the mind which are put together to make a meaning. It happens, not just with human beings, but also with animals the world of animals is full of science and sounds and they all it make science and sounds in order that each of these science and sounds communicate together meanings. For a long time I did not understand for instant that the noise made in serene afternoons in a place full of trees, by squirrels or chipmunks in India. You know they go and I use to say what a beautiful afternoon noise so salubrious and so peaceful took me ages to realize that that noise made by chipmunks or squirrels were say warning call it is a danger shout. When they saw a crow or something then they would go into this noise it is a warning call it is completely the opposite of the serenity which I imagined.

So, what I am trying to tell you is that animals use sounds and gestures as symbols to communicate meanings, human beings do the same thing. But human beings use sounds and other symbols which they create through language through text and so forth to communicate knowledge. So, knowledge is nothing but a series of grooves of thought which put together gives different meaning that is what I understood. So, science then is a very special kind of set of grooves with the very special kind of construction of meanings it took me a long time to understand what this was. McCloskey who is a great critic of orthodox economics, if you ever get a chance read a book by the by McCloskey called the rhetoric of economics it is fascinating where she argues that there is as much rhetoric in economics as there is science.

She says actually you cannot have economics by only logic there is so much of rhetoric she argues for instance that the writings of Samuelson, Becker and others which are so rigid and strict in appearance are full of rhetoric even mathematics is used rhetorically. So, here is a linguistic element then McCloskey says, economic concepts are like metaphors and they make sense in economics as metaphors do in any language. Slightly earlier than McCloskey about nineteen mid nineteen sixties Nicholas Georgescu-Roegen wrote a fascinating book called the entropy law in the economic process. If you get a chance do read it where he says, economic concepts are similes not metaphor, but he says similes.

So, Roegen says similes McCloskey says metaphors but what is important is for us to understand that these are not logical categories their categories in language. And comes a time when I read something written much earlier in nineteen thirties by Max Planck the great physicist who writes about the philosophy of physics. He says the whole language of sciences is a separate language consisting of concepts and words which have no real life existence he for instance talks of energy, energy has no real life existence it is only a concept you cannot look at energy feel it grasp it no, but it is only a concept. So, it has he lists a whole lot of concepts, which have meaning only within the language of science and so the languages are complete constructs made of such concepts which do not necessarily have a bearing with the real life.

But this language is important to science, because it does not have the complications of real life which prevent you from understanding causality. Whereas, here you can create a set of concepts which create which get a separate meaning and explain causality scientific causality very clearly. So, Planck calls the world of scientific language as the world image that is the image of the world captured in scientific language so, he says it is a different linguistic system. Now, what is of importance here is to understand then that science is far different from the way I had understood in my school days when I thought of science in my school days I was thinking of Faraday and Ampere what that who is the person who invented light.

Edison and so on and so forth working in laboratories working making experiments and dedicated to truth and so on and so forth I am sure they were all these things, but what I did not understand was that they were all working in the framework of a new language a different language. More importantly the word science attached itself in my heart and

mind as a moral category which it took me many decades to recover from, because I was convinced that all the bright kids in the school were in the science group. So, I thought all science was brilliant all non science was not brilliant so, to me anybody who was worthwhile anything in society had to be scientist anybody who was not worthwhile was not a scientist.

So, there were all kinds of confusion, but it is only after I understood Planck that these confusions were went out of my mind that science is just another language consisting of a scientific world image. Now, what is the scientific world image all about it is a world of concepts, which are tightly interlinked to make logical coherence in a very rigid sense. And it was organized or it is organized in this fashion, because strict logical coherence it is a best way in which you can explain causality. To say that x causes y you have to be very certain that only x causes only y not a hundred other hundred other things behind x who might be causing at dozen other things beyond y.

So, that to say that x causes y involves a considerable amount of logical coherence and clarity and the world of science scientific world image is just a language, which is created to acquire and to demonstrate this power of logical coherence. So, that causality in the scientific science must be might be very clearly established, which means that economics has it is own world image too. What is utility in economics? Can you grasp it with your hands can you measure it in a jar can you see how long it is with an inch tape what can you do with utility. What about the idea productivity in economics? Do we see what productivity is when we say marginal product of labor is that something which you can attribute to labor?

Although we say each additional laborer results in some product and the product created by the last laborer just now used by the firm is marginal product etcetera that language of the science. But can you grasp it can you grasp many of the laws of economics law of diminishing returns is it not it purely another fiction like the law of entropy in physics. So, you look at economics you will find that the idea of rent in economics rent is not what you pay a landlord for a monthly use of space in economics rent is something else. It is a purely derived category it is some kind of surplus derived out of calculation of some other things. So, what I am trying to show you here is that economics is full of concepts which are linked through logical coherence.

So, orthodox economic theory is nothing but a scientific world image so, the first thing we understand now is that in the construction of science and specifically in the construction of economics science. There is involved a process of construction of a language is it something stable static something, which is given forever or is there a dynamic in this is there something. Which induces transformations in this is there something induce which, induce change in this some things which induce some kind of movement in this whole structure of language and it is creation and it is making in this society. Certainly there is and that is the whole logic of research that is the whole logic of scientific revolution, but we will postpone that for a few minutes and do that after the break.