Classical Sociological Theory
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Lecture 9
Discussion with Dr. Roland Part- 1

Professor R Santhosh: Welcome to this session and in this session we have a guest, Dr. Roland Wittje, Associate Professor at the department of Humanities and Social Sciences, IIT Madras. Dr. Roland specializes in the History of Science and Technology.

I have invited him to join us in this session for a discussion on the Emergence of Science as an important paradigm in Europe, which subsequently led to the advent of the industrial revolution. Hope you remember that we had a very brief discussion about industrial revolution which is considered as one among the series of important revolutions that shook Europe during those important times.

Dr. Roland, we can start this discussion in general with your observations about the rise of Science as an important explanatory paradigm as opposed to that of religion because, this particular shift is a very important one in Sociological theory. You know that August Comte talks about positivism and he borrows this Scientific Methodology as the most important methodology that can be used within Social Sciences to understand society. The emergence of Science which was initiated by important scientists also had a very profound impact on social sciences as well.

Dr. Roland Wittje: Yes obviously, the scientific method which was kind of developed to study the natural world and describe the law like behaviour of the natural world was then extended to the social world and to humans. We usually talk about the renaissance, the early modern period also as the period of the so called scientific revolution even though the term of scientific revolution has really been criticized very much by Steven Shapin who has written one of the best books on this, starts it with the argument that there has never been a scientific revolution.

But obviously, we have a very important period from usually starting with the times of Copernicus and the transformation of a world view with the earth as the centre to a heliocentric world view. So, from Toleman to Copernican world view as a start of the scientific revolution and we can say with Isaac Newton and Newtonian Mechanics that it comes later at the end.

But then, we can even look into the times of the Enlightenment, of obviously Newton that would be the late 17th and early 18th century. The times of the enlightenment of the 18th century could really be seen as a kind of the closure of this kind of period of the scientific revolution. The emergence of what we can call scientific understanding of the natural world and also we used to be talking about the scientific method, but I would also say that a whole series of scientific methods were developed during this period.

Professor R Santhosh: While, we understand or while we usually talk about this renaissance or the emergence of scientific revolution, we usually tend to understand it as a phenomenon that happened within Europe but, how far this perception is right? Because, we know that the historical exchanges have been happening. What are the kind of or where do we trace this origins from?

Dr. Roland Wittje: I mean, we obviously have a lot of other transformations like the religious ones that happened within Europe which is known as the Reformation or you can say a series of reformations. Obviously, we have Protestantism at the rise of Lutheran Protestantism, but we also have a lot of other historical changes within world history.

Like we can say specifically, the fall of the Byzantine Empire and the rise of the Ottoman Empire for example and also the Islamic rulers being driven out of Spain and Portugal. Then Spain and Portugal subsequently becoming the places of origin of the Voyages of Discovery. I mean, we know very well about Columbus and Vasco Da Gama and their voyages had very profound Geopolitical changes and sitting here in India it is very interesting that obviously both of them were very much inspired by finding new sea route, new trading road to India.

Obviously this is not a new thing. I mean knowledge about India and trading with India and other parts of Europe or Asia has a very long history back to Antiquity, to Roman Times. But with these kind of geopolitical changes there emerged the need for a kind of lucrative trade to find new trade routes which really motivated these new voyages. These also then metaphorically became new voyages to new territory.

Geographically then, if you think about new geographical knowledge which started to question the existing geographical knowledge, that this is kind of an artefact of history that we think, people in ancient times thought that the earth was a disk and not a sphere and that is not really true, people knew or many people knew very well that earth was a sphere. But, still there was a lot of unknowns. Specifically, America as a continent and with new lands and

new geographies being discovered and new Specimens, new people were discovered which did not really fit very well in the old systems of knowledge and of knowledge classification.

Professor R Santhosh: Coming back to this question of reformation, because Protestantism is seen as a very important rational approach for the whole idea of religion and how far will you be able to make a connection between a rational based religious movement and the rise of the reason in the scientific field?

Dr. Roland Wittje: Look again, it would be from a historical point of view, positivist to draw a very linear history here like, specifically if you look at let us say Luther's or Protestantism's comment on copernicanism for example, it was not necessarily that they embraced all these kind of new ideas, what was very new and important is the whole idea to question the authority of the Church.

It was about questioning old authority as it was also about asking people. It was about the rise of book print. For example, people would read their own books like before you would have a situation where Latin was the language of the Church, and people who would not be speaking Latin they would not understand what would be said in the Church and this was the time when the Bible was then translated into Vernacular languages, into local languages and ordinary people were supposed to be reading the Bible, be attentive, to understand and supposed to reason with the Bible. As a result, when you compare the reality of the Bible and the reality of the natural world, there are certain discrepancies and the question is to make sense of these discrepancies. So, how do you bring your reading of the Bible together with your experience of the world and how do you reason for that.

Professor R. Santhosh: One of the interesting scientist whom we come across in history is Galileo Galilei who had a very problematic encounter with the Church, who was subjected to inquisition. Can you tell us more about his arguments and his lingering influence on this whole scientific level?

Dr. Roland Wittje: We see that there have been some arguments by an important sociologist Robert Merton about the link between Protestantism and the rise of modern science. If you turn to Italy we have not really the Protestantism or the rise of Protestantism, but what is very important about Galileo important for several reasons in our story, not only for his kind of encounter with the Church.

We can say if we look at Copernicus and the Copernican world view, for the longest time it was very uncontroversial. But it was rather a question of how to interpret this, a new interpretation of how the world really looks or a kind of a mathematical trick like as you can say, we use this just as a trick. But, we are not saying this is really true. In the true world, the sun is not really in the centre.

Professor R Santhosh: So, in that sense they did not really take on the Church.

Dr. Roland Wittje: They did not really take on the Church. What Galileo actually was doing it was taking on Church in terms of the authority of interpretation. Like, how do we have to understand this? Also there was an idea that the mechanics of the Heavens and the mechanics of the earth were fundamentally different from each other. Like the heavens were perfect like, a perfect celestial world and the very imperfect terrestrial world which had a lot of grounding in kind of religious understandings like, about the perfectionism of the heavens and the

Professor R Santhosh: Perfection

Dr. Roland Wittje: yeah, the imperfection of the earth and for example with Galileo's approach to the Moon for example, with the Telescope and showing the imperfection of the moon like he was bringing in a connection between, say the mechanics of the earth and the mechanics on heaven and questioning this idea about the perfectionism of the science or the movement of the stars and the imperfection earth. Along with this, he was also questioning the authority of the Bible to explain natural phenomena.

I would not say that this is an explanation or an episode of secularism, it was not really about questioning the existence of a God, this was not the case with Galileo too, that comes much later during the times of the French revolution and Laplace, an understanding of Newtonianism where he was asked in his understanding of Newtonianism, where is god in your model and he says, I do not need god in my model.

This is kind of very famous like where you really push back, no this is much more about the catholic church as an institution and the authority of the catholic church over interpreting all these kind of phenomena and he questioned that and that is the reason why he was taken to the court.

Professor R Santhosh: Yeah and also I think there were several Philosophers who shared this argument, isn't it, that we do not no longer need to require the religious explanation to understand our world rather there are other universal laws and we can use the faculty of reason to understand them. So, it was not only in the realm of science but, also in the realm of philosophy, economics and political science.

Dr. Roland Wittje: But, we have to understand there was no science as such I mean, the concept of science it would all be under philosophy like we would have the terms of natural philosophy, experimental philosophy obviously the experiment. So, very much what this kind of turned towards science is to take the nature as measure like we have both a Neo Aristotelian and a Neoplatonic influence that are coming in the near Aristotelian.

This is really a rediscovery and also a very interesting rediscovery which has happened in the early Renaissance period of Greek texts where this is very much related. We have been talking about this kind of European phenomenon or something which has not really to do with the contact with other cultures. Because, a lot of these Greek texts had been lost in Europe and through re-translation movements.

So, there has been translation movements during early Islam and up to one thousand where Islamic scholars have collected a lot of knowledge both from the Greek world, but we also have these examples in India where we have translated a lot of Hindu texts and this whole movement of the zero for example to Europe like which happened through the Islamic world.

There was also this discovery of these Greek texts and they were kind of both near as Aristotelian which was very Empiricist. We really have to learn from nature, we have to discover things in nature and Platonic, Neoplatonic which goes more in towards Geometrization mathematical models and reason.

One of the philosophers obviously, who was very central was Rene Descartes and Cartesianism like which really also this kind of idea where we can go back to Galilei and the rise of mechanics as a way of explanation and like the kind of mechanization of the world. They are the kind of underlying ideology to understand how the world works, to describe the mechanism how the world works.

Mechanization was very much at the centre of this program even though, we have to understand that this is again I would not describe these all as kind of Linear phenomena I

mean, obviously you can say mechanization there is still a lot of open space of debates like and specifically if, we talk about what has been ruling then as a kind of mechanical world view until the end of 19th century, there was never been like kind of one homogeneous way of how this was understood, there were a lot of different kind of programs under this kind of program mechanization.

Professor R Santhosh: Another very important figure, whom we must discuss I believe is Charles Darwin. Isn't it his theory of evolution really fundamentally transformed and really took on the some of the very fundamental and Cardinal arguments of the Church. So, what were the kind of reactions and what were the kind of engagements that happened between the Church and his anti-religious arguments?

Dr. Roland Wittje: I mean, the first point is to say there that we had different branches of churches, we had the Catholic Church and different protestant versions of the Church. There has not been any kind of uniform reaction of the Church to Darwinism. First, I would say obviously I would even like to go a little bit back in time and the rise of natural philosophy and really kind of the abandonment of a kind religious based understanding I mean, there were new classification systems coming in Botany and Anthology specifically with the Linnaean system coming up and as I already said, there are a lot of special specimens coming from all place in the world and before we have Darwinian evolution, we have earlier models of evolution.

For example, I mean the best known is Lamarck a French Zoologist who has brought up his own system of evolution which was very difficult fundamentally in many ways from Darwinian evolution because, in the Lamarckian evolution, every species has its very own, very separate trajectory of evolution. There is not the kind of tree of evolution which we have with a Darwinian evolution.

Ideas of evolutions were there before like Darwinian evolution. But you still find Darwinian evolution is overwhelmingly accepted in the scientific community. But, there are still some people who adhere to the idea of Lamarckian evolution as we know there are also a lot of critiques not in the scientific community but, outside of Darwinian evolution.

Then, the other thing was really debates about the geology and the age of the earth. So, people like for example, Alexander Von Humboldt. You had a lot of these kind of scientific voyages, like in the British world more known like the cook exhibition as well but, Alexander

Von Humboldt who was a German a scientist, more like a universal scientist, who had also done these kind of voyages went to the Indies for example, and these were also very typical for the times of the enlightenment i.e. doing these kind of voyages and collecting specimens from natural history, zoology and botany, but also from geology like geological specimens and then do all kinds of measurements. Magnetic meteorological measurements, collecting a lot of data and trying to make sense to organize, systematize and quantify not in the same way obviously, if you think about Zoology and Botany not to that extent but, specifically if we think about meteorology and rather than having really models of the weather.

First like collecting data this is really the beginning. If you want to know when we did really started specifically now in the times of global climate change, when did we really start collecting systematically weather data it really goes back to this time to the 18th century. Like collecting, all this kind of data and trying to make sense of this data and within that it became increasingly difficult to argue that the world would only be five thousand years old.

That just did not work anymore like, there was a lot of controversy also, even in the 19th century about the age of the earth because, there was still the question and another science came up, the science of thermodynamics and people would argue but the, the earth cannot be older than five thousand years because, then it would be much colder. Obviously, they did not know about radioactivity and radioactive phenomenon that contribute to the energy equation but, there was this whole conflict about the age of the earth and there was very clear that the Bible could not be right.

So, all this kind of data and if you look at Charles Darwin he really started out as this kind of classical you can say natural philosopher who travelled around in the world went to the Galapagos Islands and other islands and was basically collecting botanical, zoological geological specimens, like this was really kind of museum collection type rather than, the experimental type of science.

Like you have these two different traditions really like working with collections and specifying them going out to the field or experimental philosophy doing experiments in the laboratory which was very much in the 19th century a lot of it comes together also for biology.

But, Darwin really coming from this tradition and in the beginning again the resistance of the Church I mean, there is still the selection of species like which was not so controversial for

the Church, as the descent of men and making the suggestion that we are part of the natural selection of species that we are part of this tree of.

Professor R Santhosh: Evolution.

Evolution, that was obviously rather controversial but, even though I would say I mean, the reaction of different branches of the Church were rather

Professor R Santhosh: Yeah, could you say something more about these different types of reactions, because they fundamentally challenge some of the most important promises of the Church about the importance of man the whole question of creation. So, why the Church or different branches of Church forced to accept it, how did they really deal with it?

Dr. Roland Wittje: You can say regionally there were lot of differences, like you could say it was early on acceptance was actually rather early you can say, both in Britain with Huxley and also within in Germany, it was rather early accepted whereas, you had resistance both in France, but also in United States and obviously this kind of resistance of the more Evangelicals Churches in the United States which is still lingering now onwards.

Professor R Santhosh: Even now.

Dr. Roland Wittje: Whereas it was quite early on except that in the United Kingdom, what is very important about Darwinism was obvious and if we come to sociology it was kind of the extension of this, it is also which we today would rather criticize that a lot of racist theories came up and the kind of extension of Darwinism into other fields.

Professor R Santhosh: Social Darwinism.

Dr. Roland Wittje: Social Darwinism, which was actually not very much covered by Darwin, he himself never made any pronouncements on this and was kind of an extension and specifically also if you look at the colonized world and colonial science and how science was used as a tool to govern colonies and specifically if, you look at Anthropology the rise of Anthropology as a different as a discipline, where kind of physical at the beginning was kind of very much based on physical Anthropology, where people try to make claims and extend claims from Darwinian evolution into the social world.

I mean, one thing which I have been researching myself is very interesting, is music for example in the study of music, because Darwin actually mentions something already on the selection of species, he mentioned something on the importance of bird songs and sexual reproduction of birds and then you can also talk about music in there obviously, we can discuss a lot about whether birds have music or not, like a lot of people would very much argue that, but people extended that into the human world and they would be starting to talk about a kind of evolution of music.

When people went to places like India or Africa to study music of so called Primitive people, the idea of primitive people was that primitive people would be on an evolutionary lower scale and if, we would want to learn something about the origins of music as a human phenomenon we would have to study the music of primitive people.

Interestingly, enough comparative musicology led to the very fail of that idea, they figured out actually that obviously music of primitive so called primitive people is as complex as other kinds of music and also the whole idea of a kind of hierarchy of music you can say like classical, European classical music as the kind of evolutionary top of that has really been very much has not obviously was not substantiated in that research.

Professor R Santhosh: But, this idea of evolution from the natural world and then into the human world and to see that human societies across the world are destined to undergo a process of unilinear evolutionary models, it is something very central to sociology, we have almost all the early socialists talking about different laws, different stages. Auguste Comte talking about theological metaphysical positive, similarly spencer who is also talking the similar things.

So, this has been a major argument, which is why even as a discipline anthropology has this whole idea of going back to the primitive to see how they are and simultaneously they would keep the Western Europe as the pinnacle as having reached the pinnacle of human civilization and these trends came for much criticism later, but the early forms were something very similar.

Dr. Roland Wittje: Yes, you will also have already in the 19th century if, I look at German scholars obviously there was always a counter movement. Especially if you think about the Romantic movement in Germany, which was a kind of very Anti-Newtonianism or this kind of very linear Newtonianism which looked at kind of more romantic natural philosophy

movement, which looked rather into the complexity rather than into this very reductionist idea of how newtonianism at least understood back then and mathematization and similarly along with this you had a rise of the humanist ideas.

So, you would find a lot of scientists who would would say look there are limits to how much we could apply the kind of laws of nature and the kind of mechanization issues. Especially in Germany if, you come the kind of conflict between materialist philosophies and idealist philosophers who looked at the social world or the human world as fundamentally different from the natural world. You would have these kind of understandings as well but, at the same time as I said it is not unilineal like you had a lot of variety. So, you had a lot of rejection of these kind of ideas already at that time as well.

But, at the same time you are totally right a lot of people really wanted to extend and specifically wanted to understand an idea of a kind of Unitarian science, like there was this idea of the unity of science of one scientific method and to extend that to the social realm and to the social sciences as well and obviously the model for that universal scientific method that was definitely Physics.

So, the physical sciences and specifically physics and astronomy as the kind of model how science thought to be done and you also have this move away I talked already about the idea of science in the field or natural philosophy. you can say in the field ,as a field activity this idea of collecting and categorizing and creating order as opposed to experimental science and the experimental method.

But, then you also have this idea of the experimental method, moving into other realms and you really see that specifically the rise first with chemistry obviously, chemistry and what we call the chemical revolution with Lavoisier and shaping a kind of chemistry very similar to physics.

But, then also the pushback against vitalism, specifically vitalism and the idea that there is a special living force as opposed to kind of the conservation of energy, actually conservation of energy was very much the first articulations of conservation of energy came very much to push back ideas of vitalism and of a self-generating living force and then, there was also this push in.

Professor R. Santhosh: Was vitalism backed by certain theological foundations or metaphysical ideas?

Dr Roland Wittje: I would say, rather more I mean, the stream at least also vitalism was not Hegel, for example, was then also a very strong Protagonist of Darwinism in Germany vitaminism was still very much alive there in Germany. But, you can say this has been a controversy that was going on all through the 19th century in Europe and trying to give kind of mechanical explanation to life phenomena as well and obviously Darwinism does not really fit into the kind of mechanical.

I mean, it's a different kind of grand theory, that has been coming up in the 19th century and today we can even see articulations of evolution within in the physical world. People talk about the evolution of the universe for example, in these kind of, so extending the reach of evolutionary theories in science. So, what is the reach of these kind of models?

Professor R Santhosh: So, we will bind up this session and we will continue the discussion with more focus on industrial revolution in the next session. Thank You.

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