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Science, Technology and Society

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Then what Paul Feyerabend is to say about the methods of science what should be the method or methods of historical I mean we have already discussed inductivism hypothesism projectivism the views of popper and Kuhn now let us see what Paul Feyerabend is to see okay this is a eminent scholars who have propounded on the methods okay.

It does not implies that with Paul Feyerabend that defects is over just for the sake of convenience we have tried to look at this I mean even we can look at lacteous we can look at bounds we can look at stipule and so on but for given the course emplaces we are trying to look at till feyerabend okay.

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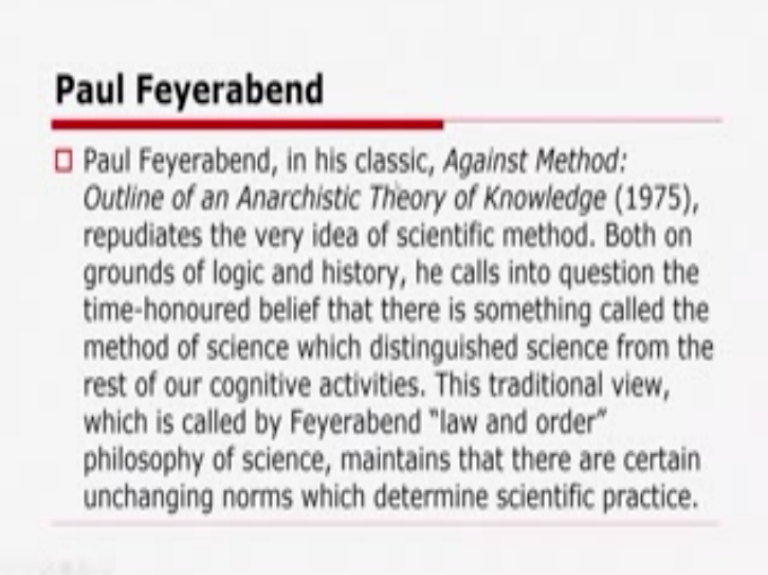

Then will move to other important resources in science technology and society okay Paul Feyerabend it is classic against method outline of an Anarchistic theory of knowledge in 1975 repudiates the very idea of scientific method both on grounds of logic and history Feyerabend calls into question the time honored belief that there is something called the method of science which distinguished science from the rest of our cognitive activities.

I mean in cognitive study in very idea of scientific method which is propounded by inductivist hypothesist projectivist popper end Kuhn this that the science is distinguish from other human activity of creativity okay and such that science is different from other radius of human activity or creativity on the basis of cognitive this traditional view about science which is called by Feyerabend law and order philosophy science.

Which maintains that certain unchanged in norms which determine scientific practices then certain norms in the traditional view of science in the traditional account of science oaky cannot be changed such norms at they these unchanging norms of in a determinant scientific practices and this law and order philosophy of science okay was question was interrogated value Paul Feyerabend okay.

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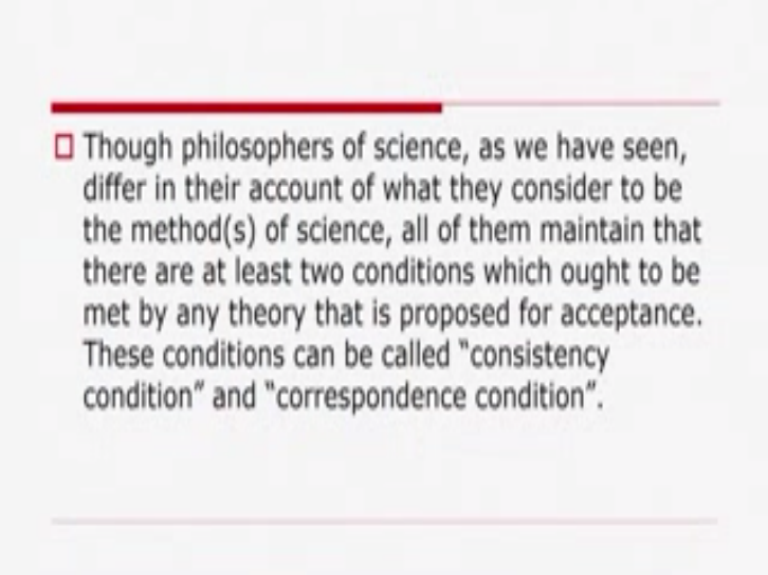

Though according to Feyerabend though philosophers of science as we have seen in the accounts of projectivism hypothesism projectivism popper Kuhn, Kuhn methodologies okay differ in that account of what they consider to be the method or methods of science all of them maintain that there are at least two conditions which ought to be met by nay theory that is proposed for acceptance.

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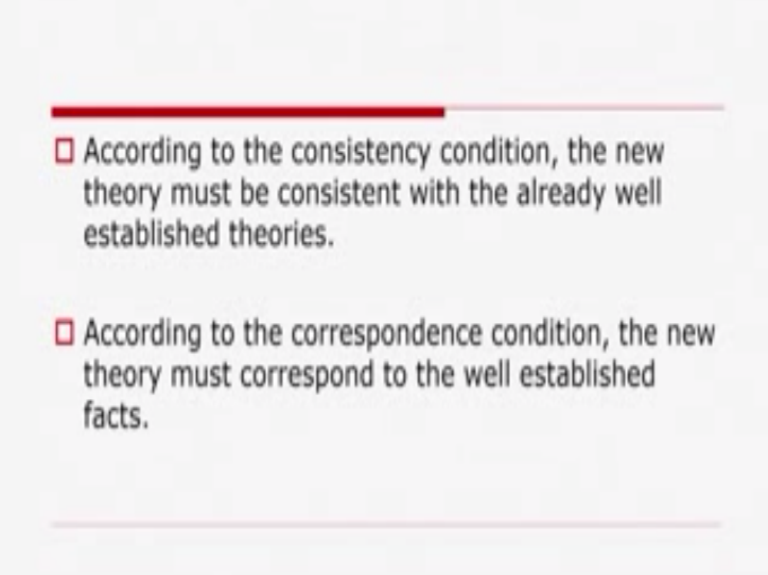

According to Feyerabend these conditions can be called consistency condition and correspondence conditions okay then what is this consistency condition what is this correspondence condition according to the consistency condition the new theory must be consistent with the already well established theories.

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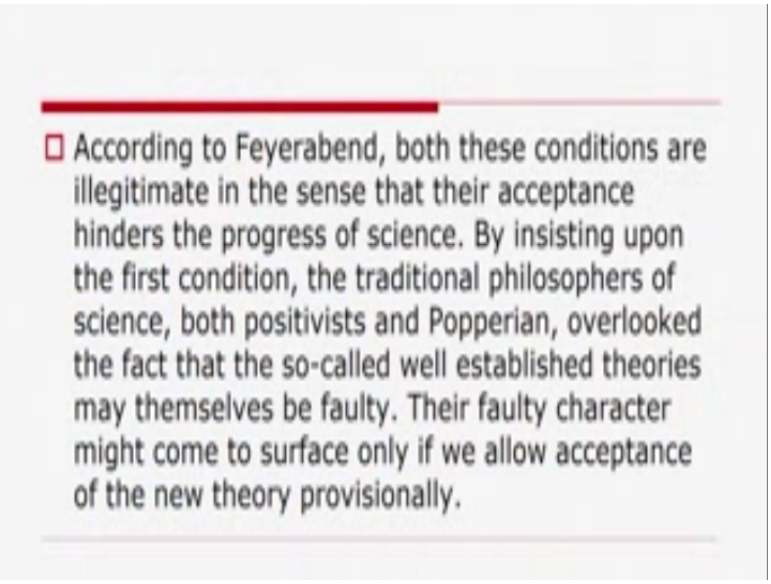

On the other hand according to the correspondence condition the new theory must correspond to the well established facts. According to Feyerabend both consistency as well as correspondence condition at illegitimate in valid in the sense that their acceptance hinders the progress of science if we accept any of the conditions whether consistency condition or correspondence condition then it obstructs the cumulative progress of science okay.

On what count for Feyerabend by insisting up on consistency condition the traditional philosophers sustains both projectivist as well as proparian over looked the fact that the so called well established theories may themselves default the faulty character might come to the surface only we allow acceptance of the new theory provigent.

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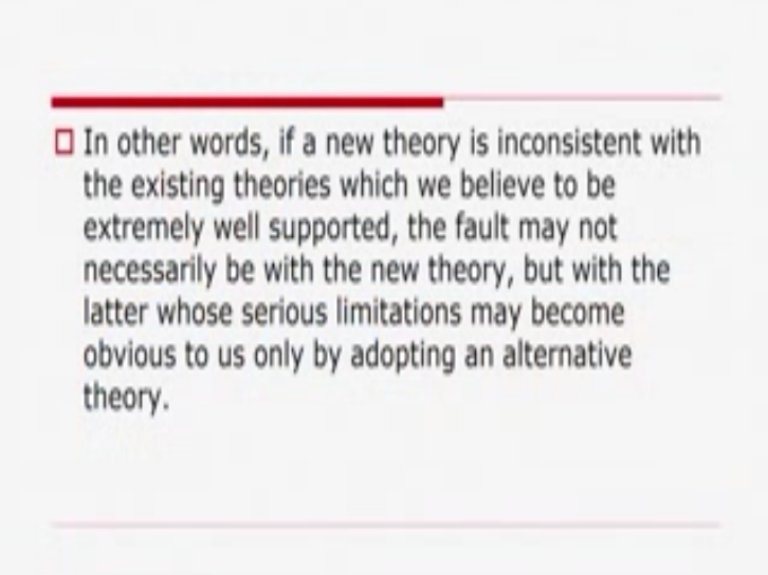

In other words if a new theory is inconsistent with the existing theories which we believe to be extremely well supported the fault may not necessarily be with the new theory but with the latter with the old theories with the existing once whose seriously limitations may become obvious to us only by adopting an alternative theory.

That is to say that this is where this is the problem if we follow consistency condition then what kind of problem that we are going to encounter if we follow the if we insist on the correspondence condition by insisting of the correspondence condition we may be thought the chances of a very good theory at remain blind to the series laconic of the existing theories which we might this.

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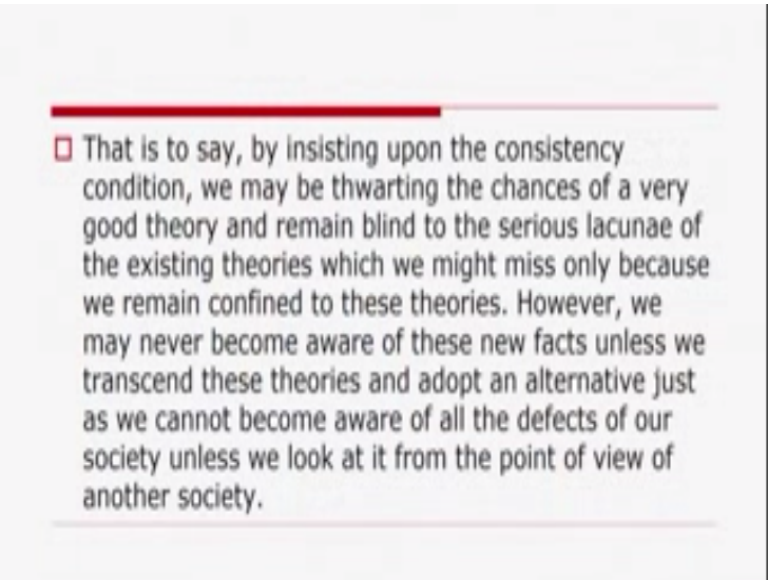

Only because we remain confined to these theories however we may never become aware of these new facts unless we transcend these theories and adopt an alternative just as we cannot become aware of all the defects of our society unless we look at it from the point of view of another society okay.

That is why when there was sathi as in sociological term if I say when there was sathi when sathi was practice even we know in some parts of the country even today sathi practices but that is that bright is burnt alive along with the dead groom and did you it was a cultural practice for centuries when the British question this when rajaramohan question this how did the question on the basis of science on the basis of science.

On the basis of looking at such practices such evil practices of once own society deservedly the other societies okay such evil practices the such practices of sathi used to be consider the norms it was the rule but such practices where question where interrogated only by looking it other societies other progressive societies other developed societies oaky.

That is why we make never become aware of this new facts unless this theories and adapting alternative just has we cannot become aware of all the defects of the society unless and until we look at it from the point of view of another society okay it is very important to look at all possible points that is why the usage of suppose when labor used the turn cognitive achieve to understand the need of the other to understand the role of the other.

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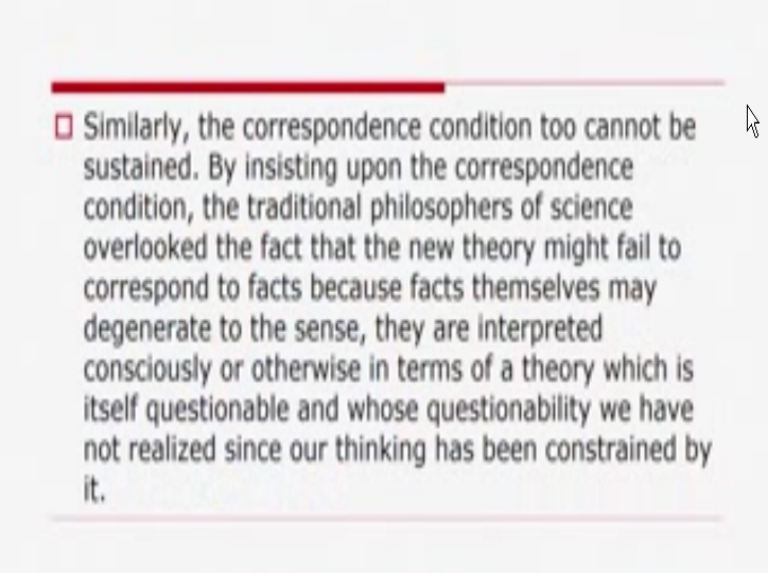

How are you going to judge yourself only when you look at your point from the stand point of others okay this is very important similarly the correspondence condition to cannot be sustained by insisting of the correspondence condition that traditional philosophers of science according to Feyerabend over looked at the fact that the new theory might fail to correspond to facts because facts themselves may degenerate to the sense that they are interpreted consciously or otherwise in terms of the theory which is itself questionable and whose questionability we have not realized since our thinking has been constrained by it.

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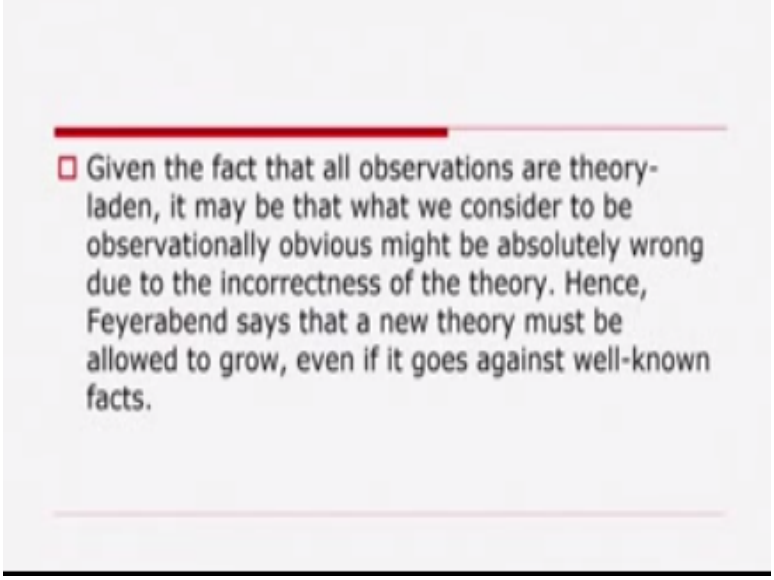

Given the fact that all observations are theory laden, in where Popper argued in favor of this it may be that what we consider to be observationally obvious might be absolutely wrong due to the incorrectness of the theory. Hence, Feyerabend says that a new theory must be allowed to grow even if it goes against well-known facts.

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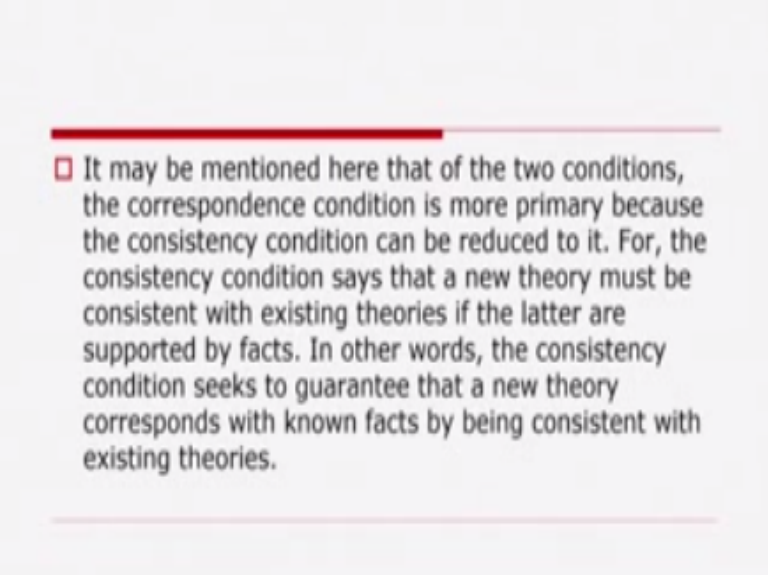

It may be mentioned here that of the two conditions the correspondence condition is more primary because the consistency condition can be reduced to it. For the consistency condition says that a new theory must be consisted with existing theory if the latter ate supported by facts. In other words, the consistency condition seeks to guarantee that a new theory corresponds with new known facts by being consistent with existing theories.

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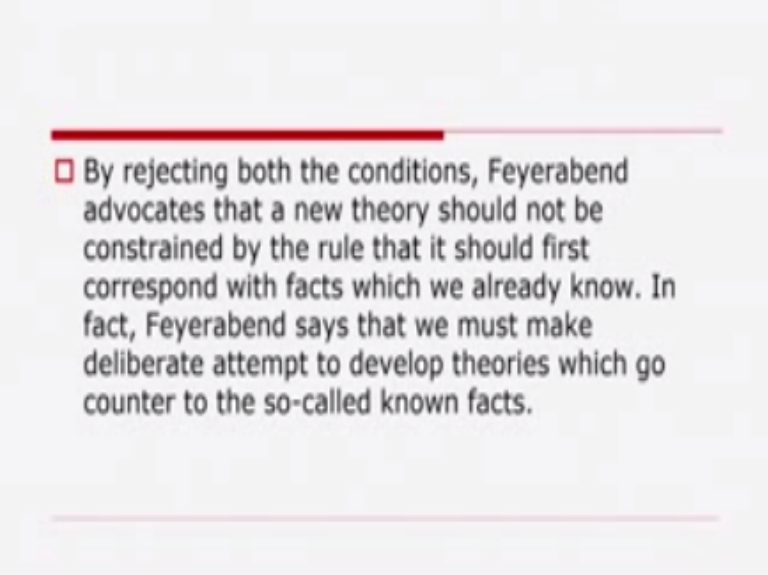

And Feyerabend rejects both conditions, by rejecting both conditions Feyerabend advocates that a new theory should not be constrained by the rule that it should first correspond with facts which we already know in fact where Feyerabend says that we must make deliberated attempt to develop theories which go counter to the so called known facts. Thus, Feyerabend try to object, try to refugiate the very law and order philosophy of science.

Now Feyerabend in fact goes one step further okay, he challenges his traditional opponents namely Popper, Kuhn projectives, inductivist, hypothesis and so on by saying let me quote Feyerabend from against method he says,

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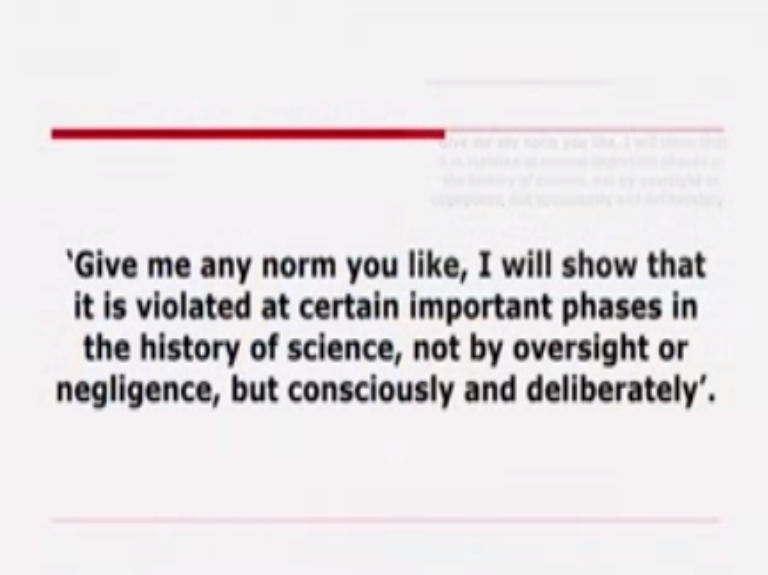

'Give me any norm you like, I will show that it is violated at certain important phases in the history of science, not by oversight or negligence, but consciously and deliberately'. I repeat, 'Give me any norm you like, I will show that it is violated at certain important phases in the history of science, not by oversight or negligence, but consciously and deliberately', okay. According to Feyerabend in the most productive periods of science of any science.

If I, if we explicate these, this statement 'give me any norm you like, I will show that it is violated at certain important phases in the history of science, now by oversight or negligence, but consciously and deliberately' if we try to explicate this then we see that according to Feyerabend in the most productive periods of any science, scientists found themselves in situations which are true complex to be tackled by simples rules of thumb.

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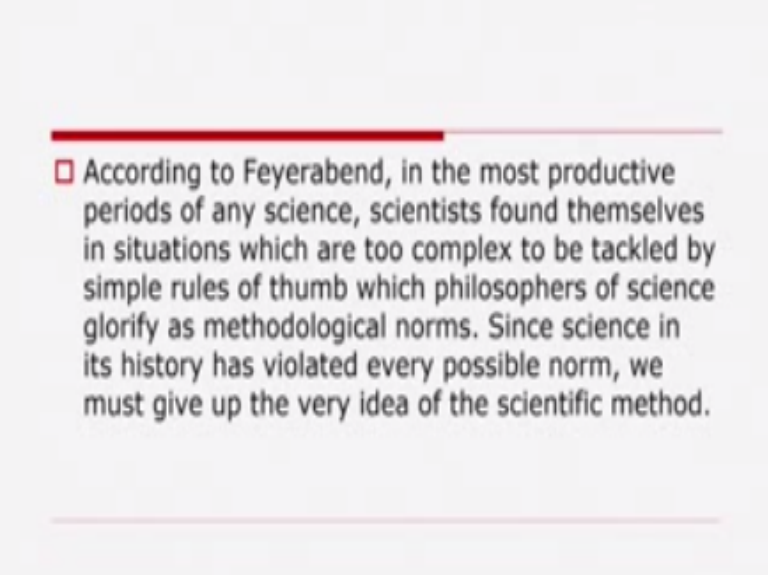

Which philosopher of science glorify as methodological norms those rules of thumb became methodological norms for philosopher of science. Since in its history has violated every possible norm, we must give up the very idea of the scientific method.

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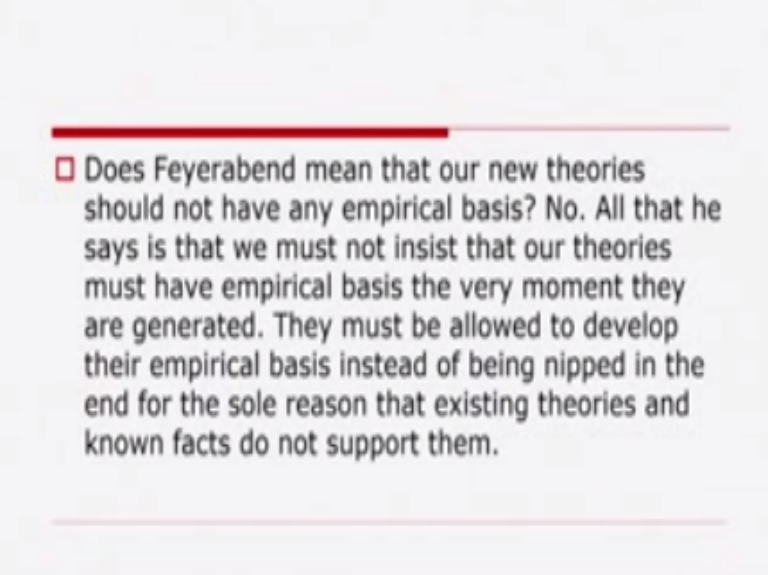

Does Feyerabend mean that our new theories should not have any empirical basis? No, never he never meant that. All that Feyerabend says is that we must not insist on our theories must not insist that our theories must have empirical basis the very moment they are generated. They must be allowed to grow, they must be allowed to develop their empirical basis instead of being nipped in the end for the sole reason that existing theories and known facts do not support them, okay.

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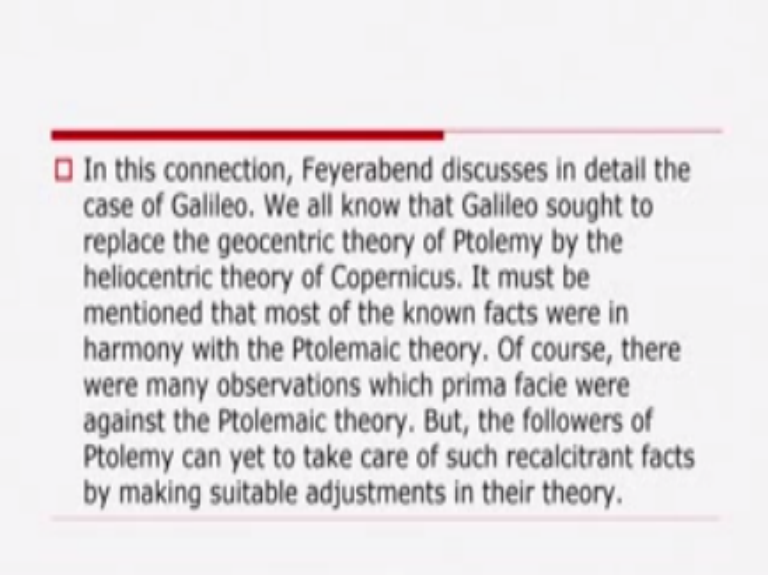

In this connect ion Feyerabend discusses in detail the case of Galileo. We all know that Galileo sought to replace the geocentric theory of Ptolemy by the heliocentric theory of Copernicus. It must be mentioned that most of the known facts were in harmony with the Ptolemaic theory, okay. Of course, indeed there were many observations which prima facie were against the Ptolemaic theory. But the followers of Ptolemaic can yet to take care of such recalcitrant facts by making suitable adjustments in their theory.

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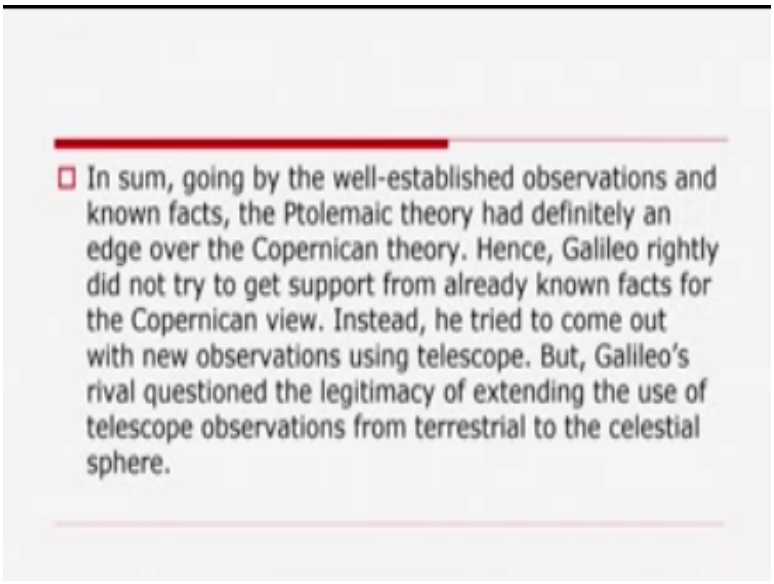

In a nut cell, in sum going by the well established observations and known facts okay, the Ptolemaic theory had definitely an edge over the Copernican theory initially. Hence, Galileo rightly did not try to get support from already known facts for the Copernican view. Instead, he tried to come out with some, with new observations using telescope. But, Galileo's rival questioned the rival questioned the legitimacy of extending the use of telescope observations from terrestrial to the celestial sphere, okay.

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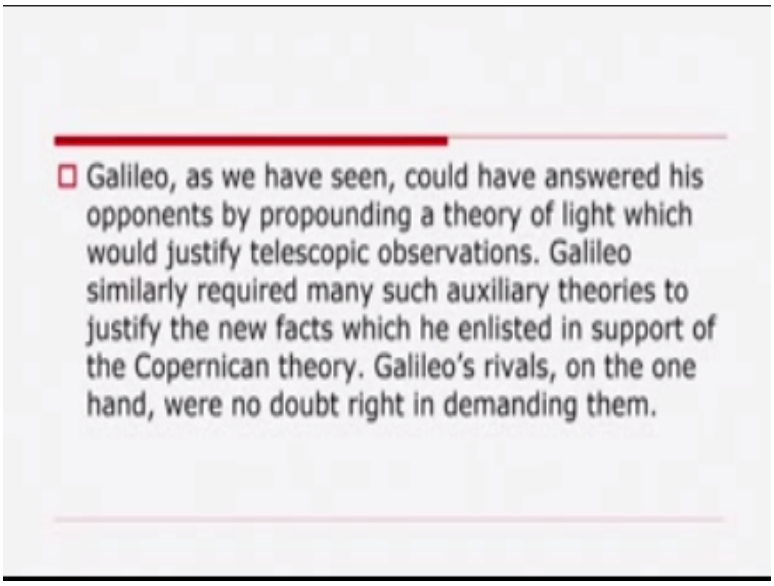

Galileo as we have seen, could have answered is opponents by propounding a theory of light which would justify telescopic observations. Galileo similarly required many such auxiliary theories to justify the new facts which he enlisted in support of the Copernican theory. Galileo's rivals on the one hand were no doubt I mean right in demanding them.

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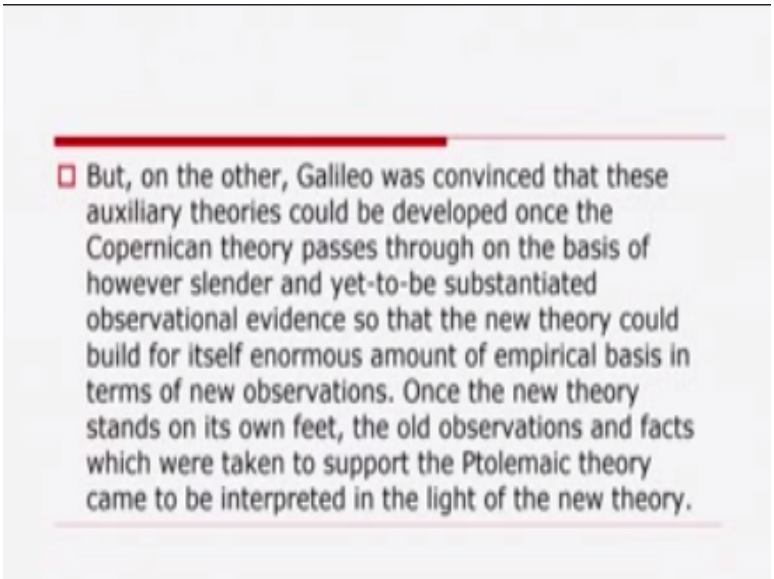

But on the other, Galileo was convinced that these auxiliary theories could be developed once the Copernican theory passes through on the basis of however slender and yet to be substantiated observational evidence so that the new theory could build for itself enormous amount of empirical basis in terms of new observations. Once the new theory stands on its own feet, the old observations and facts which were taken to support the Ptolemaic theory came to be interpreted in the light of the new theory.

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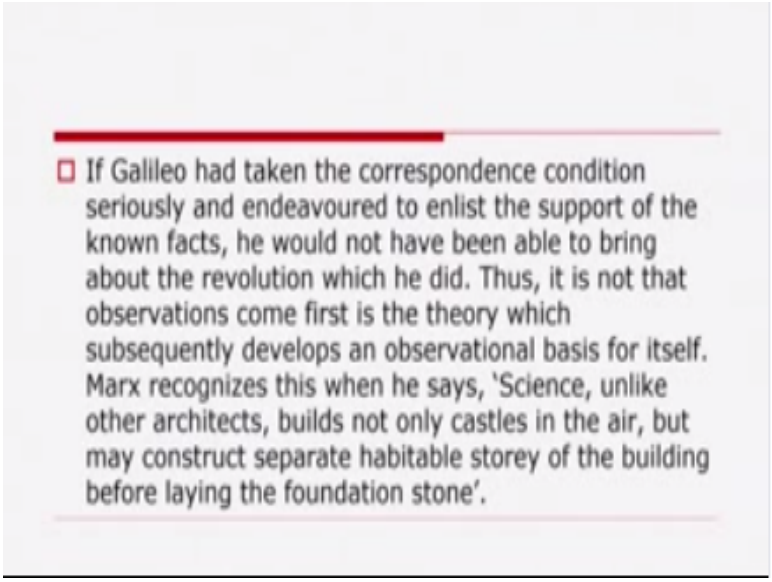

Had Galileo taken the correspondence condition seriously okay, has is I mean even there have been rejected correspondence condition right, I mean had Galileo taken the correspondence condition seriously and endeavored to enlist the support of the known facts, he would not have been able to bring about the revolution which he did. Thus, it is not that observations come first is the theory which subsequently develops an observational basis for itself. Marx recognizes this when he says science like, science unlike other architects builds not only castles in the air, but may constructs separate habitable storey of the building before laying the foundation stone.

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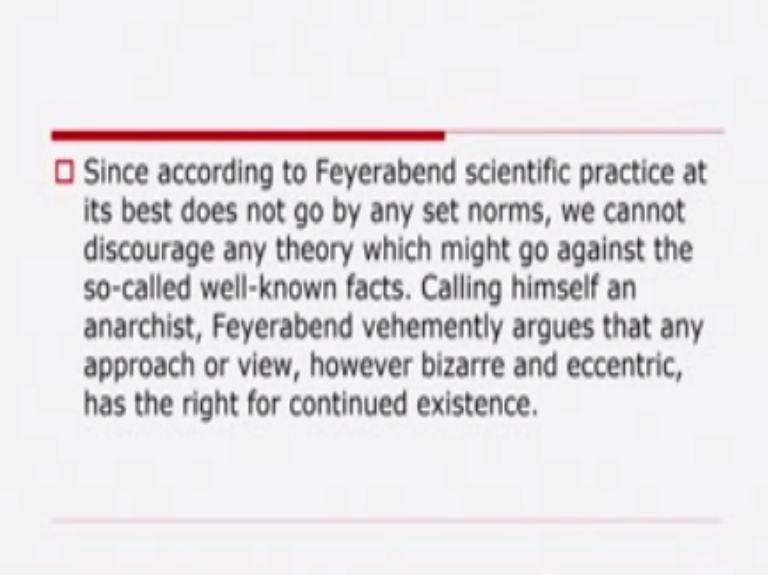

Since according to Feyerabend scientific practice at its best does not go by any set norms, we cannot discourage any theory which might go against the so called well known facts. Calling himself an anarchist Feyerabend vehemently argues that any approach or view however bizarre or eccentric okay has the right for continued existence, okay.

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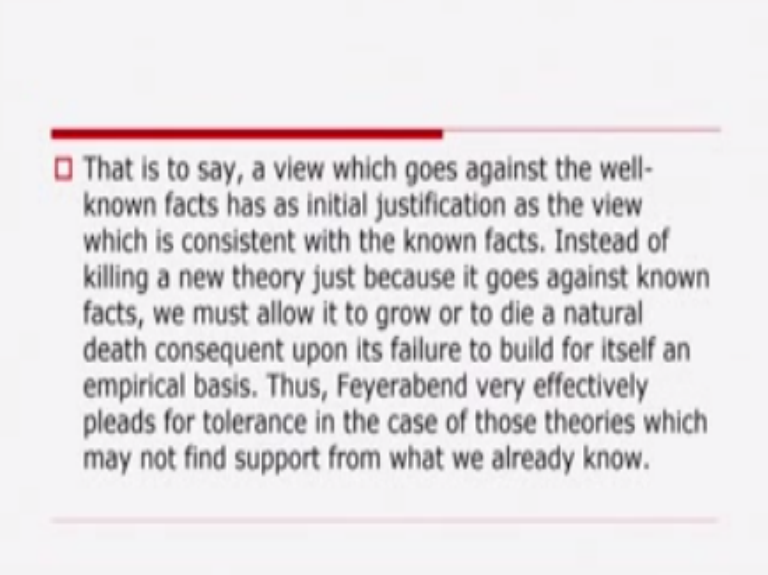

That is to say a view which goes against the well known facts has an initial justification as the new sorry, I mean a view which goes against the well known facts has as initial justification as the view which is consistent with the known facts. Instead of killing, instead of rejecting a new theory just because it goes against known facts we must allow it to grow or to die a natural death consequent upon its failure to build for itself an empirical basis. Thus, Feyerabend very effectively pleads for tolerance in the case of those theories which may not find support from what we already know.

It may be mentioned that, it may be mentioned against Feyerabend let us such a tolerance will lead to the mushroom growth of theories.

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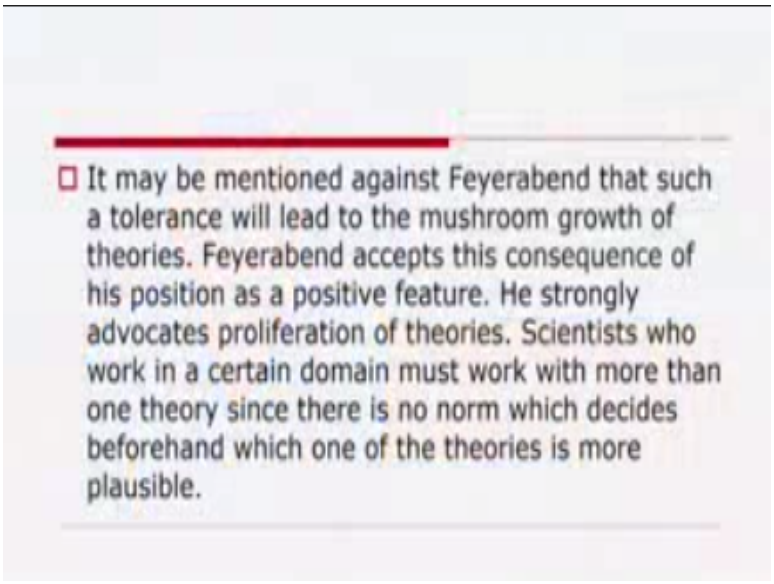

And interestingly without doubt Feyerabend accepts this consequence of his position as a positive feature I mean mushrooming. Mushroom growth of theories it is a positive feature. He strongly advocates proliferation of theories. Scientist who work in a certain domain must work with more than one theory since there is no norm which decides beforehand which one of the theories is more plausible.

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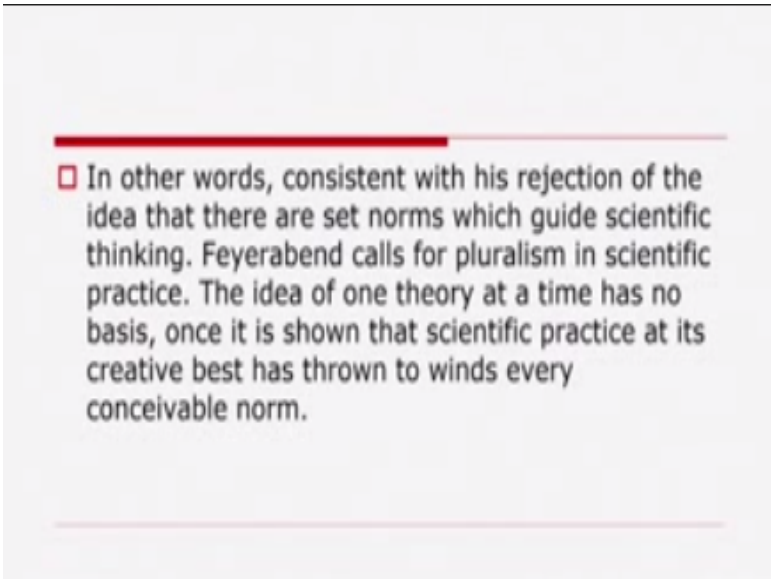

In other words, consistent with his rejection of the idea that there are set norms which guide scientific thinking Feyerabend calls for pluralism in scientific practice. The idea of one theory at a time has no basis once it is shown that scientific practice at its creative best has thrown to winds every conceivable norm.

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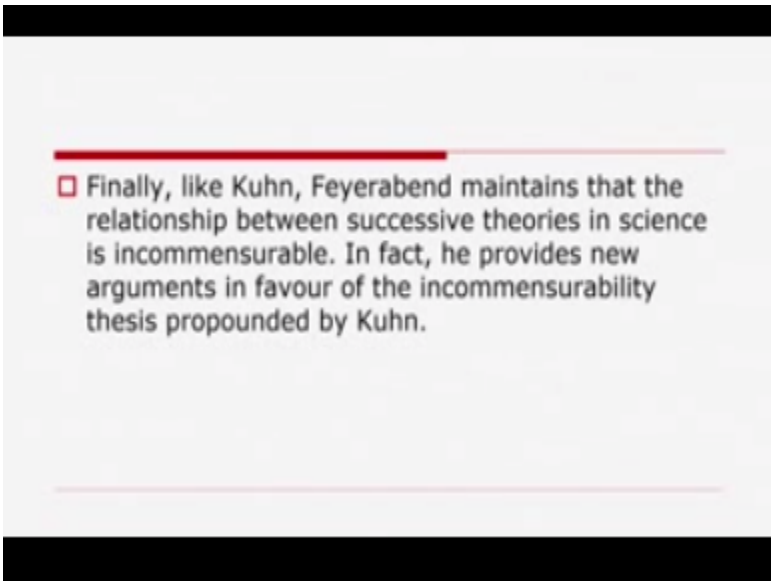

And finally like Kuhn feyerabend maintains that the relationship between successive theories in science is incommensurable I mean that's what in commensurable that are why I gave you the example of demand commercial I can go a little straight forward I can say securely religion believe in feyerabend in religion okay, they can also constituent incommensurable this is in certain context okay secular event communalize of yearly that the constitute comments okay I mean opposed categories the new one must be income the new paradise science must be incommensurable with the old one or the existing one in fact feyerabend provides new arguments in favor of.

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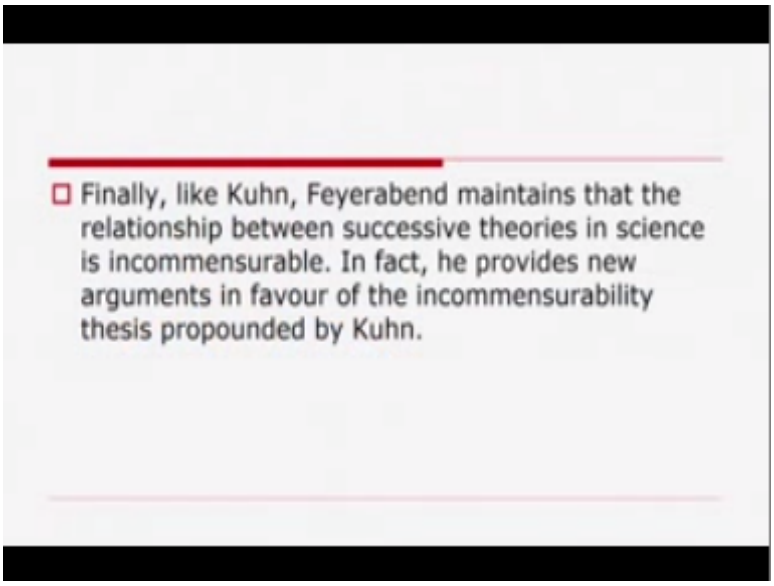

In commensurability thesis propounded by Kuhn.

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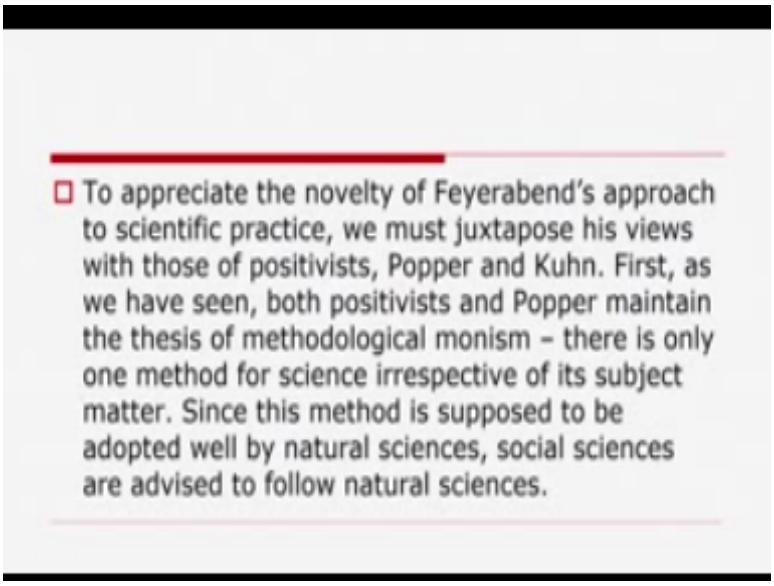

To appreciate the novelty of Feyerabends approach to scientific practice we must juxtapose his views with those of positivist's popper and Kuhn we are always trying to compare right we also compared popper with Kuhn we compared detective with hypothesis again positivists, positivists with popper with Kuhn now we are trying to make a comparison okay we are trying to make comparison of feyerabands views these are the views of positivists popper first as you have seen both positivists and popper maintain the disease of methodological.

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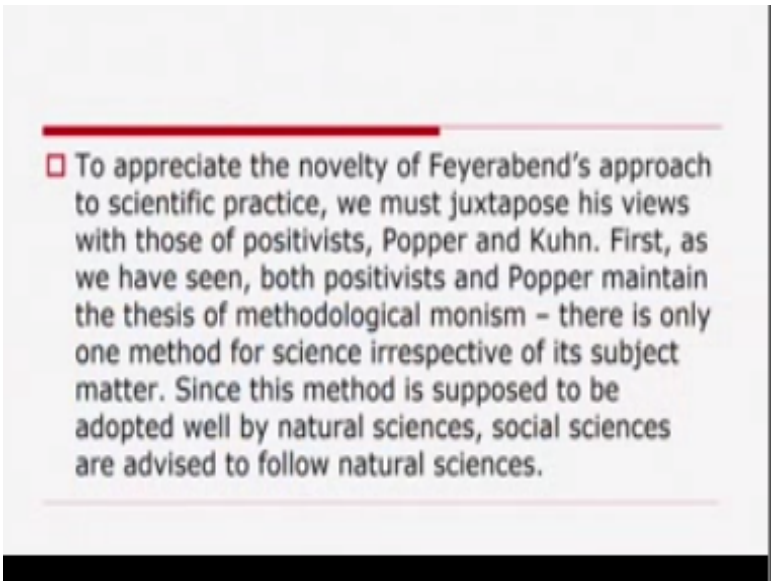

That is only one method common to all sciences irrespective of the subject matter since this method is supposed to be adopted well by natural sciences social sciences are advised to follow natural sciences where social sciences modeled on the basics of natural sciences social sciences borrowed so much from the natural sciences.

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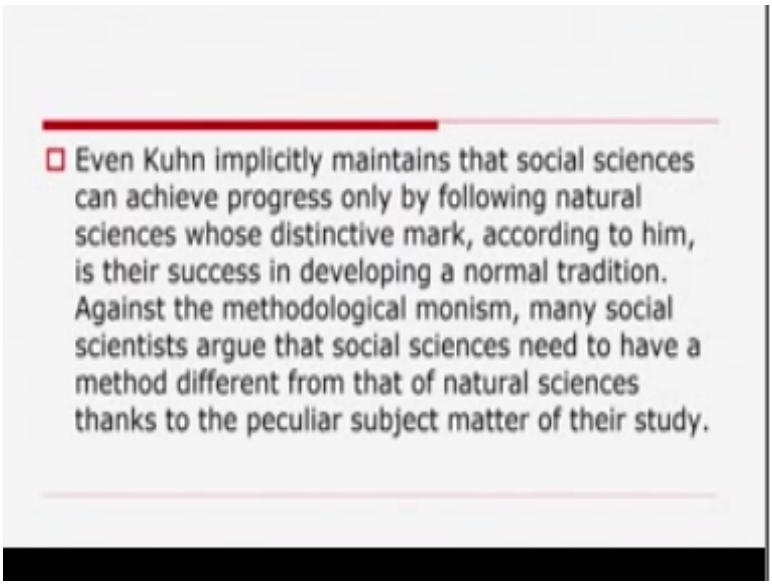

I mean metholody even Kuhn implicitly maintains that social sciences can achieve progress only by following natural sciences whose distinctive mark according to Kuhn is their success in developing a normal tradition I mean the transition that's why Kuhn made a distinction between astronomy physic chemistry and biology on the one hand and creative various like art literature new philosophy.

And even medicine on the other right that's why we said on the social sciences may not enter I mean it is impossible for social sciences to enter the stage from pre prelatic stage because of the nature of the problems the nature of research questions involved and that's why that the way Kuhn implicitly maintains the social science can achieve progress only by following natural sciences whose distinct mark according to him according to Kuhn is the success in developing normality because normal tradition is found only within a particular paradigm not in the pre paradigm stage.

Okay against the methodological monism that there is only one method common to all sciences respective of their subject matter okay such arguments against methological monism many sources of scientist argue that source of sciences need to have a method different from that of natural sciences thanks to the peculiar subject matter of that state in this process influence school of thought which went by the name of hence verstehen school that dominated social science is general.

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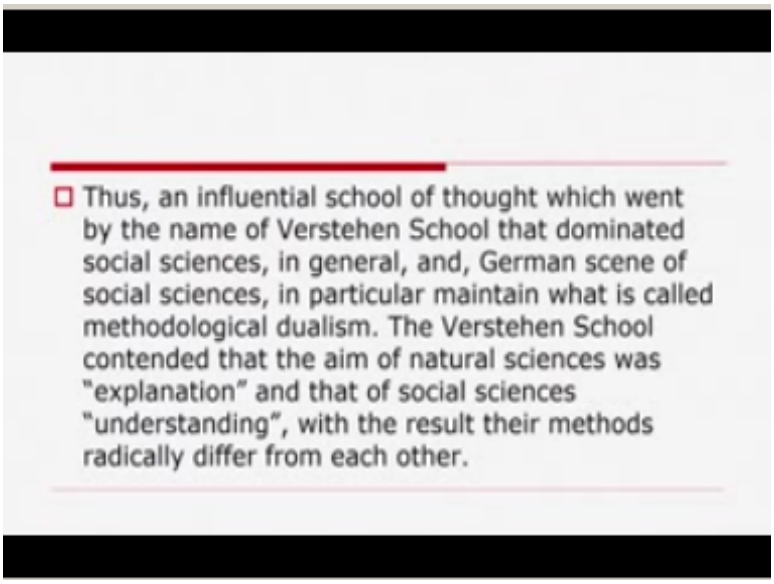

And German science of social sciences in particular maintain what is called methological dualism the verstehen means understanding in German verstehen means understanding it was used mostly in the workers of maths verger he said I mean understanding also okay this understanding can be direct understanding can be indirect understanding is alternatively known as observational understanding indirect understanding means also known as explanative understanding of social sciences.

Okay what verber try to do here and try to explain in the context of verstehen that knowledge is generated at two levels I mean verstehen theoretical methodological canals between positive and new positive version you know I mean the methological canals of science okay objectivity of science suggest that the world that we see the knowledge that we produce generate okay that why we cannot also critic to your region I mean that is the difference story all together I mean we need not I mean we can still go on and on but for our convinced I mean for given the core structure we must restrict our need okay this is that knowledge is subjective that our knowledge of the world is subjected our knowledge of the world not absolute.

Okay that was also pointed out by popper that's why he used the very similarly close to truth but not truth itself truth likeness truth nearness okay but the method which was propounded by verstehen school of thought okay it maintains that no we do not require methological model rather methological plural okay we require both objectivity as well as subjective percepts about

the knowledge that we create that we generate okay the verstephen school of thought contained that the aim of natural sciences was explicinit.

And that of social sciences understanding with the result the methods radically differ from each other okay explanation comes under the lubricant of positivity school of thought whereas understanding comes under the lubricant of new continent school of thought or in subsequently we will attribute understanding to verstephen school okay and theses is metholodical duality we but inductive hypothesis positivity I mean popper I mean its specially positivity if you will get okay for then knowledge can be generated only through okay methological moniting for the verstephen school of thought for the positivity of the verstephen school of thought.

Okay for then it is not simply explanation it is not simply methological monitoring but also one more accepts it is very important understanding of social accept okay then if I say understanding of social okay that comes under new verstephen school of thought okay that is why combined together explanation and understanding okay they constitute methological dueling in the school of social sciences in the frame work of social sciences.

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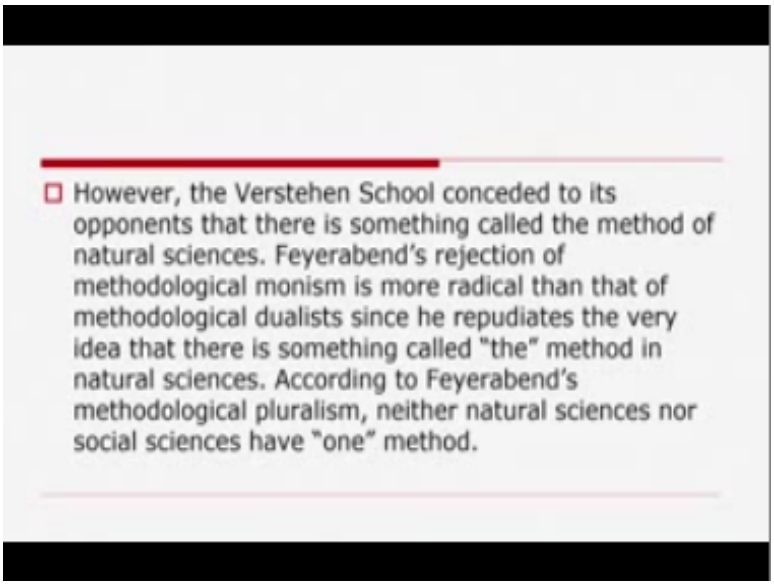

However, verstephen school contained to its opponents that is something called the method of natural sciences feyeraneds rejection of methodological monism is more radical than that of methodological dualists which the verstephen school of thought populated since repudiates both the very idea that there is something called the method in natural sciences that there is something called the method in natural sciences the method okay.

According to veraabins metholodical pluralism neither natural sciences nor social sciences have one minute cannot afford to have only one metal there cannot be the method of science or there cannot be a set of methods of science but there are multiple methods of science which can help in the furtherance knowledge production okay let say not simply methodological mornegy methodological dual legitimate not simply methodological morn means positivists propounded not simply methodological dual images the Verstain School of third propounded okay but we required methodology religion as okay secondly by leading for.

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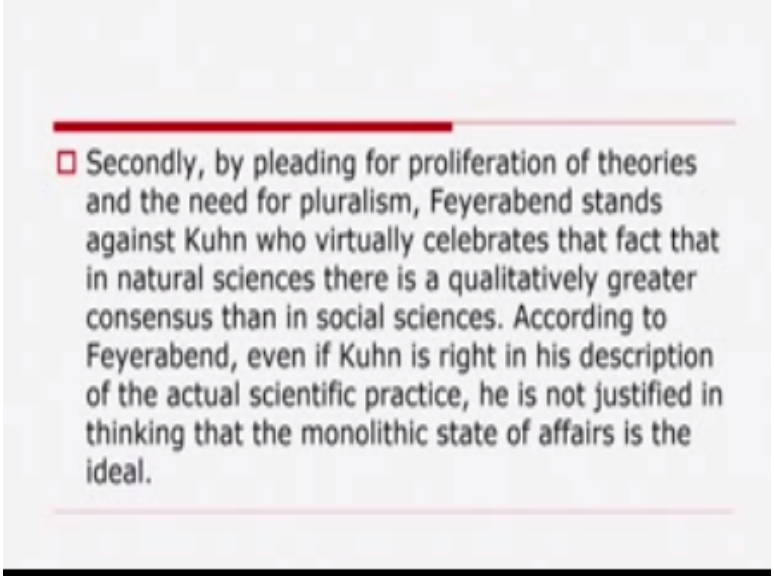

By leading for proliferation of theories and the need for methodological pro release in feyerabend stands against Kuhn who virtually celebrates the fact that in natural science is there is a qualitatively greater consensus than in social sciences I mean that is why as there is a qualitatively as there is a qualitatively greater consensus in so natural sciences natural sciences namely astronomy physics, chemistry and biology they make a transition from pre paradetic metaic stage to the paradict meatic stage.

As there is a relatively less consensus in fact it is I mean it is very difficult to arrive at a consensus in the social sciences it is a different question altogether where it is desirable to have a consensus or not okay, philosophically speaking the ethically speaking I will it is no desirable to have consensus, even in natural sciences or in social sciences I mean it is now desirable okay that is why we always, talk about multi cultural religion in the context of democratic certain okay that is another but what I mean here is that the way feyerabend stands against Kuhn as Kuhn virtually celebrate.

The that the I mean celebrates the fact that in natural sciences there is a qualitatively greater consensus than in social sciences for feyerabend even if.

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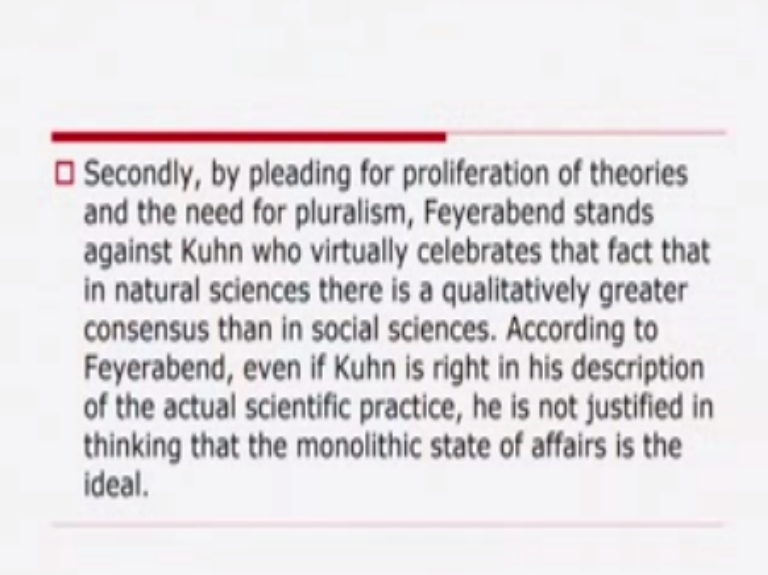

Kuhn is write in his description of the actual scientific practice is not justified in thinking that the monolithic state of affairs is the ideal.

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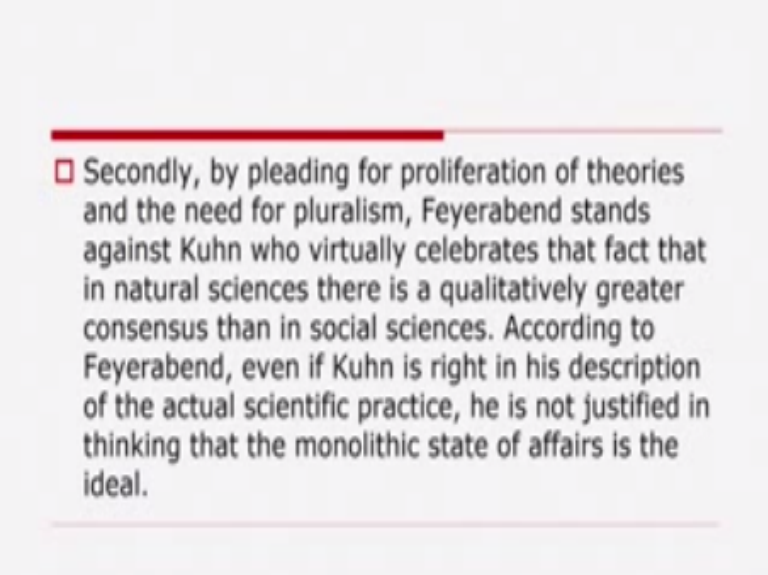

In other words kuhn's idea of paradigmatic stays as the ultimate phase of scientific evolution paradigmatic that advocates the need for post paradigmatic stage in which scientific practice is characterized by morality.

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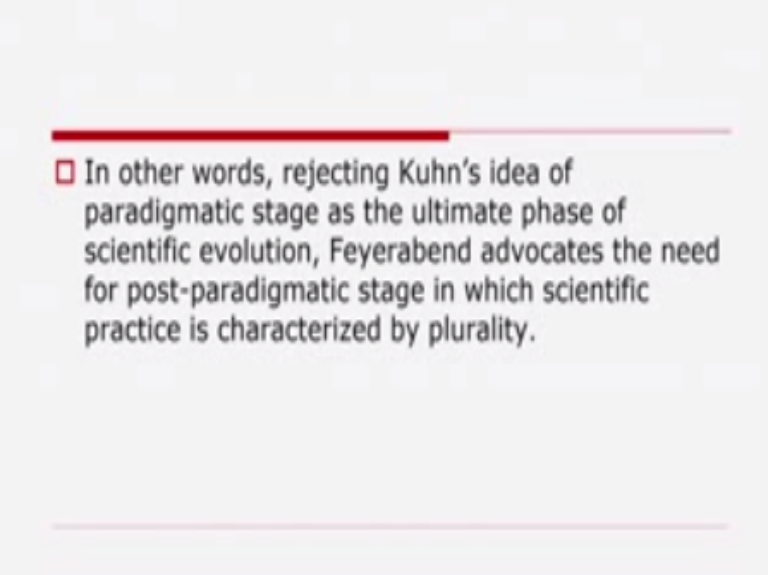

Finally let us put it does positivists popper and Kuhn in different ways sort to so how science is unique whereas according to positivists the uniqueness of science among our various types of cognitive activities like common sense are to religion etc. Consist in the systematic verifiability of scientific claims according to popper it is systematic falsifiability of scientific claims and it is consensus according to.

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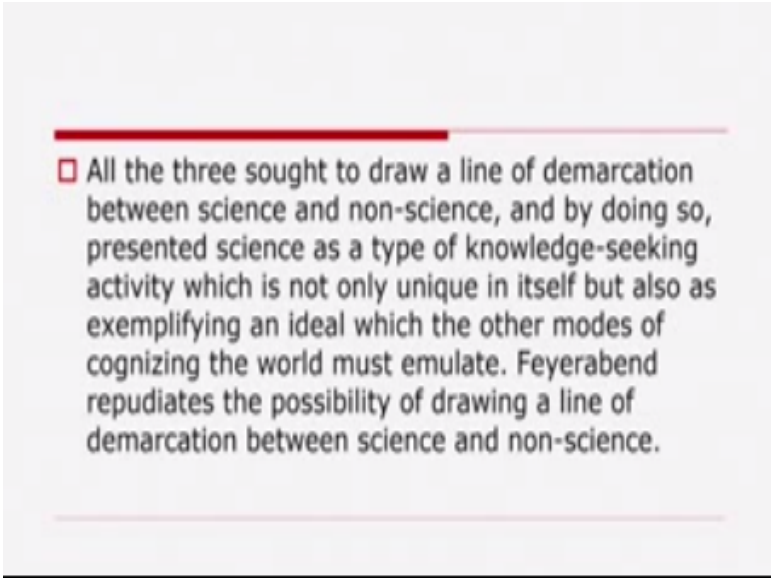

On the three positivists popper and kuhn's sort to draw a line of demarcation between science and non science and by doing so presented science as a type of knowledge seeking activity which is not only unique in it itself but also as simplifying and ideal which the other modes of cognizing the world must emulate, Feyerabend repudiates the possibility of drawing a line of demarcation between science and non science.

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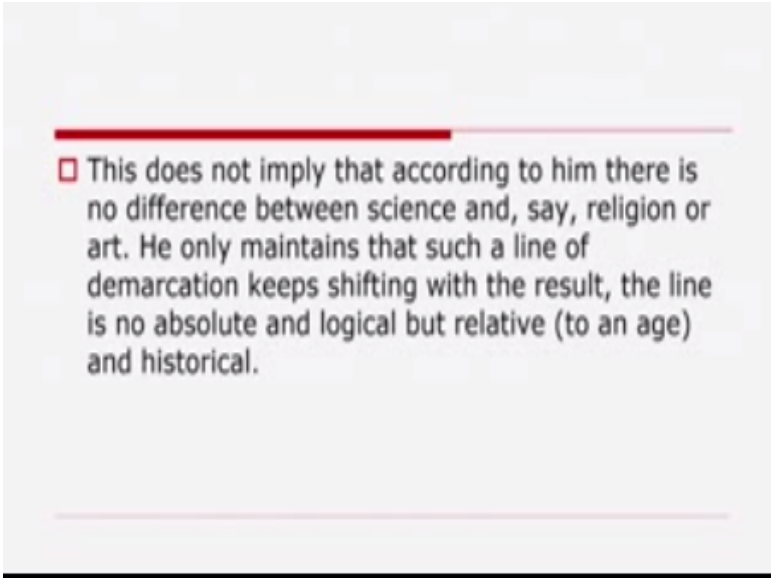

This not imply that according to there is no difference between science and say religion or on the only feyerabend only maintains that such a line of demarcation such a line of demarcation shifting with the result the line of the line is not absolute or and logical but relative to an age to an he spoke to an error is historically condition in Kuhn suggested that science must be examine in terms of it is historically integrate but the way feyerabend left one step further okay that such a line of demarcation between science and non science shifting okay keeps ultimately with the outcome.

Okay under line is not absolute under line is also not logical it is spontaneous it is relatively politically culturally institutionally ideologically ethically, legally they are conditioned okay, that is why whenever that is why I said why it is very much related to an edge and invoke and historically spoke and era why does he says these, why does Feyerabend say these precisely because of the fact that the way I gave you the example where India should go hide with nuclear tests or not it is a scientific question or a political question.

Such decisions on whether India should go ahead with nuclear tests or not okay, they such decisions are not absolutely scientific, they are not absolutely logical but they are relative and they are historically conditioned they had been forced by the aligns between the scientific and political elites of the country, okay.

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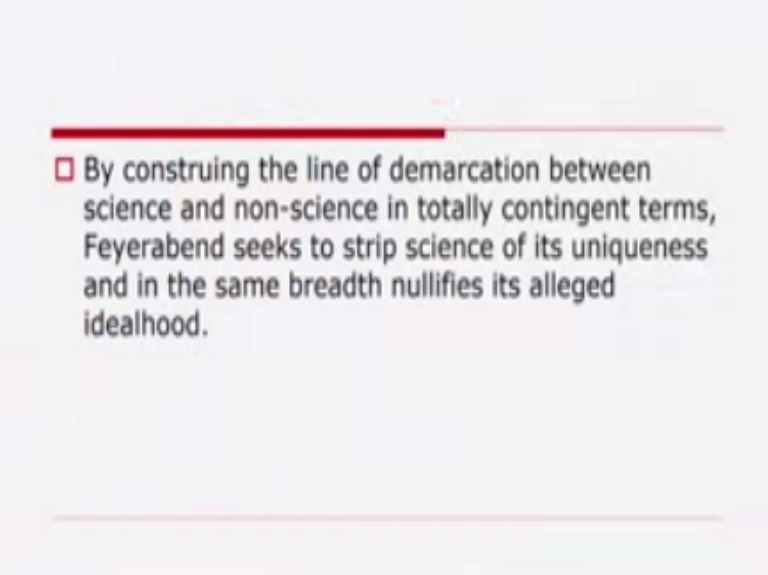

By construing the line of demarcation between science and non science in totally contingent terms totally dependent terms okay, totally related terms Feyerabend seeks to strip science of its uniqueness and in the same breadth nullifies its alleged idealhood. The way inductivistics, hypothesis, Popper, Kuhn and projectives they tried to place science on a higher feudalistic these are the other forms of inquiry other domains of inquiry okay, because of its uniqueness, because of its supreme issue, over non sciences Feyerabend's seeks to strip science of its uniqueness and in the same breadth nullifies it against idealhood, okay. According to Feyerabend the idea that sciences unique is based on the myth that.

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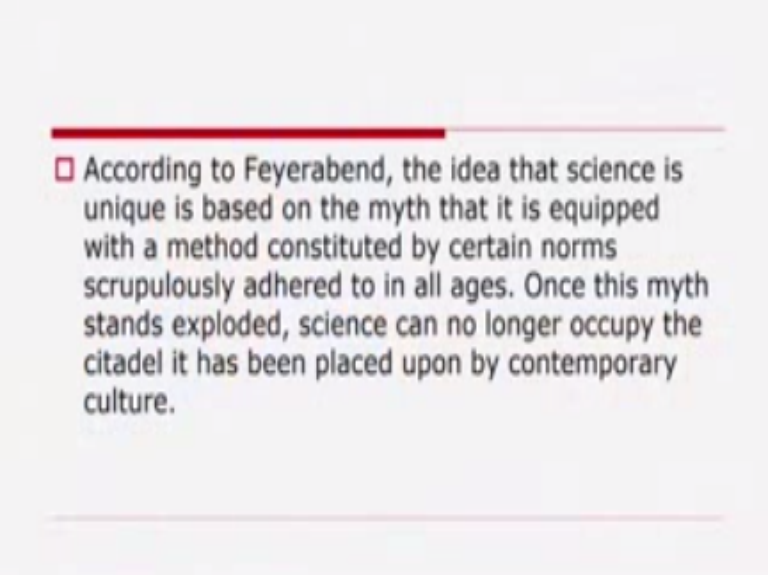

It is equipped with a method constituted by certain norms scrupulously adhered to in all ages. Once this myth stands exploded science can no longer occupy the citadel it has been placed upon by contemporary culture, okay.

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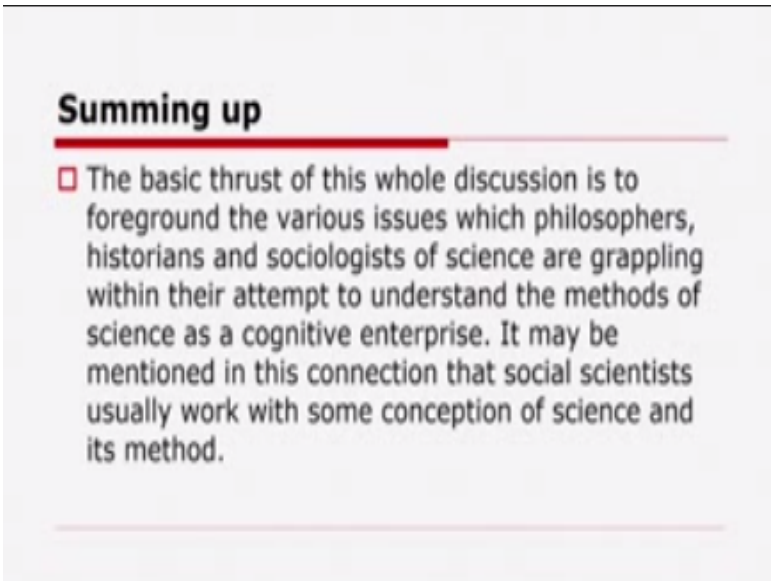

Now let us sum up the methods of science I mean last I mean the fast which was devoted to the some introductory remarks on science technology and society ontological questions as well as the normative structure of science okay. The second, third and fourth weeks we have been discussing the methods of science starting with inductivism, hypothesize, project regime, Popper, Kuhn and Feyerabend, okay.

If we look at this methods of science I mean these last three weeks second, third and fourth week okay, weeks you will find that the basic transit of this whole discussion is to foreground the various issues which philosophers, historians and socialist of science have grabbing within that attempt to understand the methods of science as a cognitive on the batch. It may be mentioned in this connection that social scientists usually work with some conceptions of science and its method.

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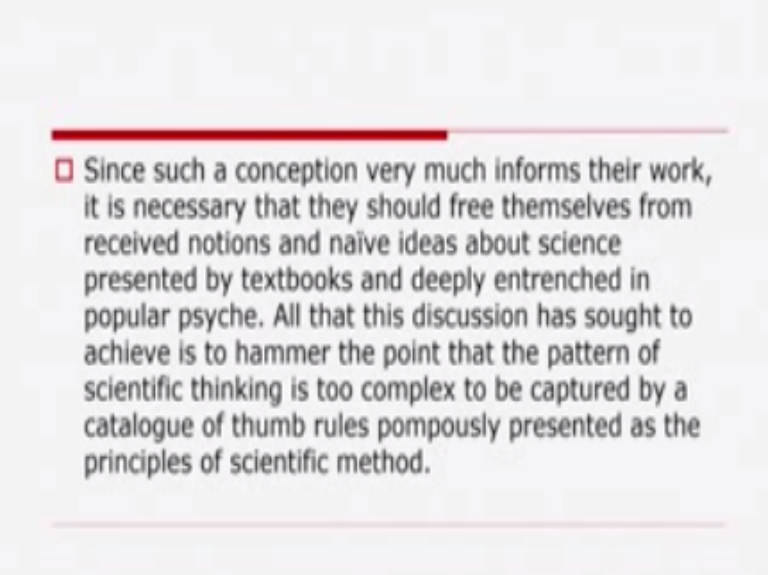

Since such a conception very much informs their work it is necessary that they should free themselves from received notions and they must be able to challenge okay, such received notions must be challenged such demarcation autonomy and cognitive authority of science must be challenged okay, it is necessary that they should free themselves I mean philosopher of science, historians of science, socialist of science they should free themselves from received notions main stream conventional notions and nive ideas about science presented in text books and deeply entranced in popular science.

All that these discussion has sort to achieve is to hammer the point that the pattern of scientific thinking is too complex to be captured by a catalogue of thumb rules nor proposals presented as the principles of scientific method, there cannot be draw method of science there cannot be the perspective on the perspective on science we live in a multi cultural world, we live in a more democratic world okay.

We have to follow certain methods if there is a scope to follows certain methods there must also be scope to exercise our freedom to decent freedom to decent becomes an integral part of the process of democratize not simply in social science but also in natural scientist okay this is a very important then what have we discussed in intuitivism we discussed that science must start with observation remains at the level of observations and must end with observations.

We start from observational data without request to any theory set the second step suggest that from observational data we must provide a attentive generalization which requires verification

and then we formulate tend to formulate a low in hypothesis science must start with hypothesis then the hypothesis will go for I mean it may be tested right or wrong if it is tested right then it w\should be accepted if it is tested wrong then it should be rejected on the basis of this we may conclude in hypothesis scheme.

In positivism science must start with observation then a set of large then a set of statements describing initial conditions and finally the statement finally the way we try to conclude with the way we try to provide an explanation that the statement describing the phenomenon to be explained in a popper scheme of in the popper methodology what we do that we try to I mean science must start with identifying the problem.

Then it must suggest a hypothesis in the form of at tentative solution to our problem are hunch which involves systematic falsification that systematic falsification may result in refuted or collaboration I mean if a hypothesis is tested wrong it will be refuted as in the case of hypothesis schema if a hypothesis is tested right then it should not be accepted as in the hypothesis scheme it is rather it should be collaborated it should be kept parentally tentative.

Under what limiting conditions okay our hypothesis has been tested right or wrong because our hypothesis has because you need 100 of instances to prove a theory to test a hypothesis right but you need only one wrong instance to test your hypothesis wrong okay. For Kuhn the kind of scientific revolution that we will make revolutions in science okay transformations is science that we make it is a I mean every science must pass through two stages pre paradigmatic stage.

And paradigmatic stage within paradigm paradigmatic stage what we find it is a there is a norm bound science puzzle solving activity day to research activity in the form of normal science, normal science when I say it does not mean normal or abnormal science I mean normal science means norm bound science okay within norm bound science we encounter anomalies such as I mean unexpected un-anticipated or unexpected occurrences or happening from there on science becomes crises ridden and from crises there is we feel an urgent need of searching for a new paradigm as against by replacing the old one by replacing the existing one.

But the existing one remains until and unless we find a new one and the new paradigm the transition from crises to new paradigm is mediated by revolution science I mean science I mean scientific revolution that is why Kuhn try to bring about similarities between a scientific

revolution and a political revolution okay it is very important to understand this may be implications.

Whereas Paul Feyerabend repudiates the very idea of scientific method I mean unlike he is predecessors including inductivity hypothesis proper for positivism Kuhn every way he reputed its, he rejects both consistency and correspondence conditions as we have discussed earlier. Now in the following class what we are going to look will discuss how technology has a different political property that is how the very idea of scientific city technology highest society okay may be challenged okay.

But before getting in to the fifth week okay what we will do in the next lecture that will provide certain assignments okay in the form of some kind of exercise okay. And from there on we will move to a point of do artifacts of politics as somebody said that I mean do it many philosopher of science historians of science social visits of science they have mentioned this that how technology is inherently political inverse how their social in nature how they are economic in nature they are not autonomous activities which we discussed as passing remarks in the interlocutory lectures from there on okay we will try to in the next week this is what we are going to discuss but will first start with the assignments okay, thank you.

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