

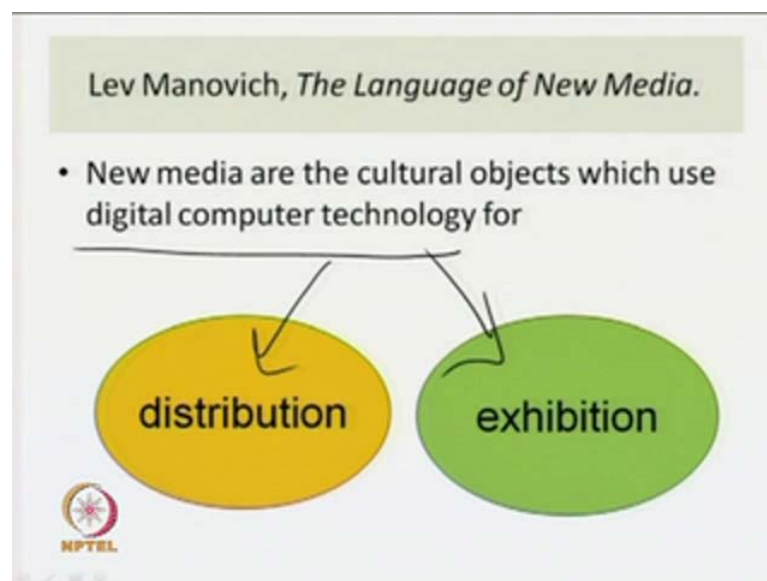
Cultural Studies
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Module No. # 04
Culture Industries, Cultural Forms
Lecture No. # 06
Science, Technology and Culture

Welcome to NPTEL– the National Programme on Technology Enhanced Learning. This is an initiative by the Indian Institutes of Technology and the Indian Institute of Science. As you are aware, we are in a series of the lectures collectively entitled cultural studies, and we have already completed three modules and part of module four, which is our last module, and today, we are in lecture six of the last module, which is entitled science, technology, and cultural studies.

As always, let us do a recap of what we did in the last lecture. The last few lectures, you would remember, were devoted to largely to media to cultural forms, to cultural industries, to television, ok?

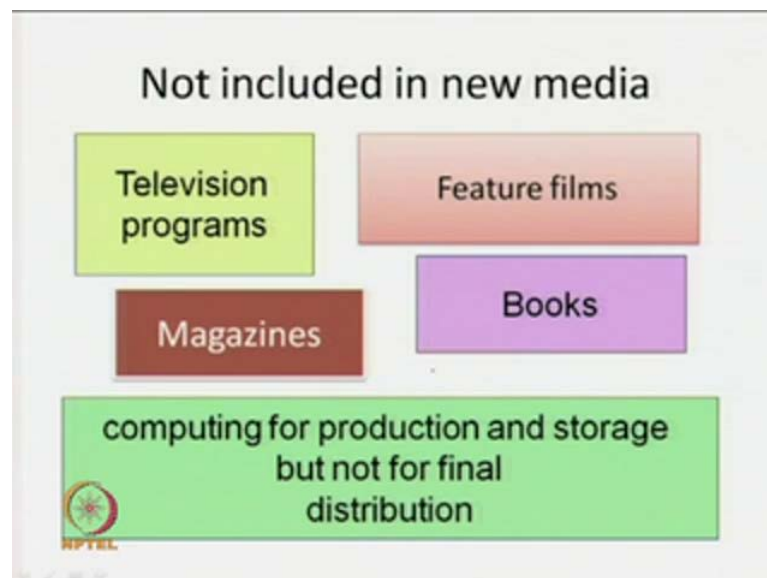
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Today, we are going to go into other dimension or other area within this module, but let us do recap of new media, which was our topic of discussion in the last lecture. And we saw in the lecture on new media, we saw, after Lev Manovich, in his book– The Language of New Media, that new media may be differentiated from the so-called older media by one important fact, and a that is, new media are the cultural objects which use digital computer technology for distribution and exhibition, meaning it should not be only for storage purposes, ok?

Even old media used such technology for purposes of storing data, but there should be an exhibition using digital computer technology, and also, importantly, there has to be an element of interactiveness that is allowed by the new media.

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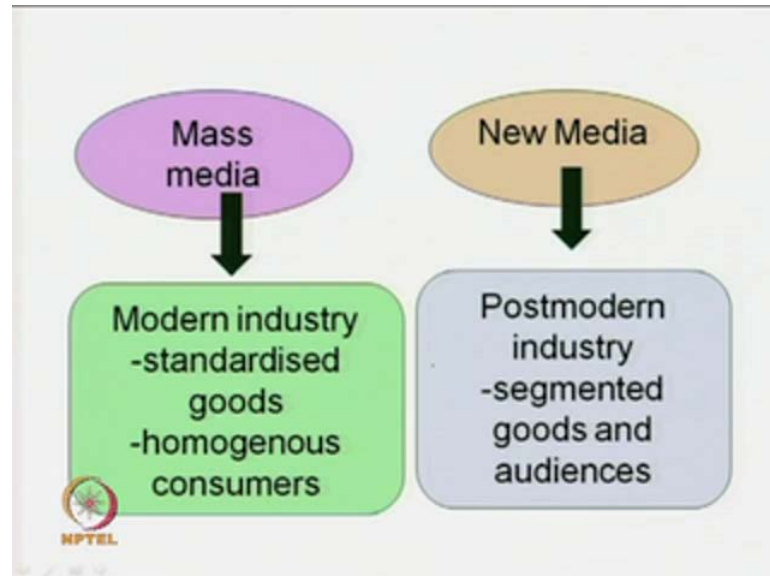


Then, we, **we** found that some of this interactive communication forms include, among other things, the blogs that you read, the podcasts, the social **network** sites, which are very popular, the RSS feeds, the Wikis and hypertexts where we know that hypertexts– how it is interactive? It is interactive because it allows you to comment and annotate on already existing original text. So, what are what are the things that are all forms that are not included in the new media.

Those forms– media forms– that are not included in the new media are television programs; look at the slide, please. Television programs, feature films, magazines,

books, and the important point here being that computing for production and storage are used, all **right**, but not for final distribution.

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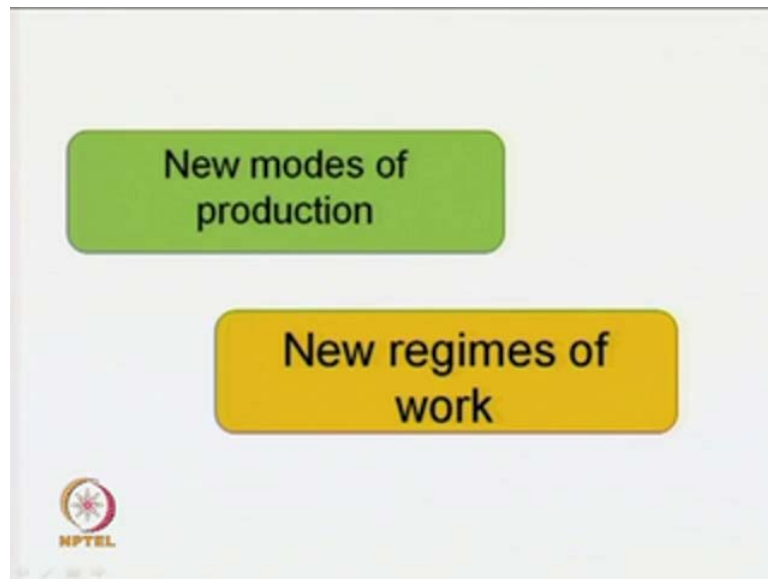


t of view of the nature of the industry and this these are this that mass media is do with modern industry w`l v ith standardized goods homogenous consumers **right**.

Ah which was which has as the found in the last few lecture devoted to media **media** forms cultural industry which have received a good amount of critic from scholars the new media is do with po

stmodern industry where we have segmented goods and segmented audiences in set of homogenous goods and audiences.

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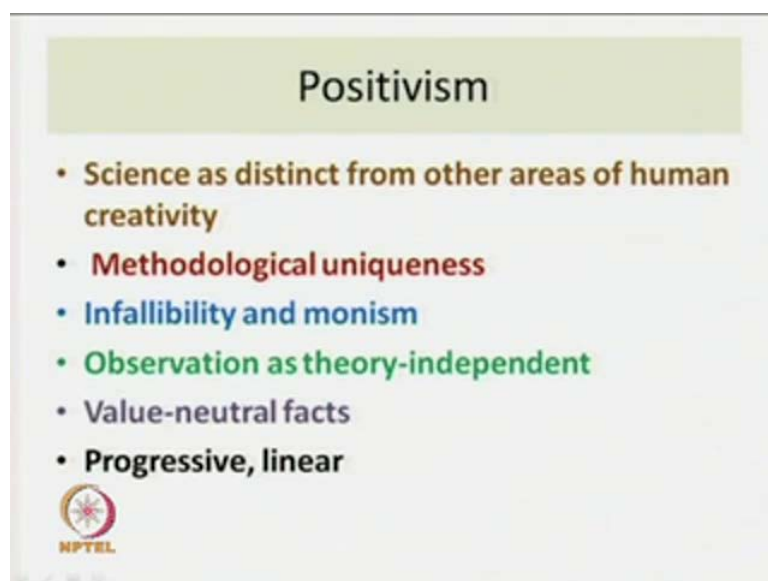


This also gives raised as the saw in the last lecture to new modes of production and new regimes of work fine. So, i hope this we recap you know by. In fact, by new media we have already touched upon some of the things that are going to come up in our next few lecture which is you know science and technology cyber cultures

or cultural studies and. So, you the different between a cultural studies exploration science and technology and an s t s exploration of science and technology.

So, the as always lets

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then we talk about science technology and culture **right.**

All in science technology in society, but for the purposes of this lecture I shall be bringing in essays on science technology and society and cultural which are included for instance in Toby Miller's edited volume a companion to cultural studies and Simon During's cultural studies reader.

Fine.

So, before we move into the cultural analysis of science and technology very briefly let us talk about domain with which we happen to contrast that is STS are this science technology and society.

STS has as its objective of course, science and technology it is method is an empirical 1 where there is investigation of the practices workings and materialities of science

written

We are looking at the practices done by you know by carried out by scientist in the laboratory we are trying to look at the laboratory not as a neutral place we are trying to look at the laboratory as a cultural place and the meanings that in manage the methods that are used are into scrutiny and many say point number 3 many say that the methodology is quite again to

an ethnography 1 ok

Now, why did we require cause social studies of you know are of science and technology or STS are now today contemporary cultural studies of science and technology.

Now, this was largely as a reaction to a school of thought or movement to speak in science and technology which was known as positivism ok.

So, let us look first at what this moment was against which we find a scrutiny an imperative in scholars to scrutinize the working of scientist to scrutinize you know the philosophy of you know the philosophy of science helps us to scrutinize this things. So, first we are going to therefore, look at positivism as a school.

Now, as movement positivism looks at science as distinct from other areas of human creativity, science and the positivism is something that is you know sacrosanct, write the activities of scientist or are sacrosanct activities after all why because they are supposed to give us quote on quote the truth right

So, science was . So, science as having method

as sort of the you know it was the precise tool of the scientists and this uniqueness was also for you know believed to be 1

that was again sacrosanct and that could not be questioned why because after all scientists were trying to give us truth.

Then there was an infallibility about science and monism there was an observation or there was a understanding are are observation as being theory independent that ork.

In that sense the narrative therefore, that comes to us of science is 1 that is progressive and 1 that is linear the belief within this framework is this that science gets better and better you know with times science is progressive in the sense that knowledge grows progressively almost in the linear fashion ok.

So, which means meant that yesterday's science you know cannot be better than today's science. So, you see this was this kind of thinking about of science which we called not simply sciences of course, even other domain social sciences.

We we call positivism and sort of you know radical positivism was what propelled this study of social you know the social study science and technology.

Before this we did have since the greek times we did have you know the the the philosophy of science philosophy of science being a very important part. So, much. So, that many do not want to sort of ah want to demarcate to separate areas of philosophy of science and sociology of science ok.

Now, together if we look we if we look at it in a liberal sense together the philosophy of science the sociology of science and the cultural studies you know exploration of science form very important form a very powerful domain in critiquing of both axiom in postulates in sciences of in as is a ment 1d infallibility for a science is concerned and a

cultural studies you could you know very safely say is the latest entry in to this critical enterprise right

1 of the first 1 of the first you could say promises your key promises in this way of looking at science and technology that is the cultural way of looking at science and technology is that a science is socially determined and b science is culturally specific ok

Now, if many wouldn't agree with such a passively how can science be socially determined, but we shall see in a while for example, taking you know taking the example of newton's principia.

We shall see how science is also socially determined science is also culturally specific in the sense that science also part takes of the signifying practices that are available or that are sort of in currency the science and the meanings that are in general currency in general culture ok

Now, if we have to look specifically are if you ask me what is cultural studies specifically look at as far as science and technology are concerned a is then only 3 different ways we see science itself as a culture we see science if now culture defined as a way of life as we saw in our you know initial lectures

If cultural is defined as a way of life then science and and the scientists are set to be also in a way of life. So, science are doing science becomes a way of life with its own practices with its own codes and meanings with its own vanguards. So, to speak and its own watched out right

So, as we found a science as culture is the first way of looking at science by cultural studies second science and technology or technoscience which many people use the word technoscience today saying that science and technology can really not be separated.

So, science and technology or technoscience seen as also shaping culture that is a second way of looking at science and technology from a cultural studies perspective and science and culture third science and culture are also seen as creating cultures of science **right.**

Now, for for scholars for instance like bruno latour and others this is for them most important the cultures of science now by cultures of science we do not mean only the practices of scientists

We certainly also do not need only the laboratory life what we mean is the system of codes and way scientific statement are encoded and the way and the way scientists and students are talk to the decode those science ok

Ah they are also have diagrams graphs which are not in in language right mathematical equation how they also are brought in the enterprise of science. So, the culture of science would be would ranged on the epistemological right down to at the actual effect that science has on on society ok.

So, now you're aware that if if your ask what are the you know aspects the key aspects that are taken up in a cultural studies understanding of science then we would say that these are a sciences as culture science and technology has shaping culture and the cultures that are you know that are established by scientific practices fine

As said a while ago we would be looking at an example of how you know science impacts culture how science is socially determined how it is culturally specific now this was given to us russian scholar name to boris hessen ok

Hessen talks about newton's principia and many of us would simply look at newton's principia in a you know in in the way science was conceived of earlier at least by the majority of people.

As a value neutral science and has sort of you know isolated from all social and cultural processes right hessen on the other hand says that newton's principia apart from being scientific mathematical texts it was related to if you look at from the point of view of being affected by you know sociopolitical events by affected affected by the sort of the what we call the zeitguys in germen the zeitguys of the spirit of the age.

Then he says that we have also to look at newton's principia as serving the interest of british mercantile capitalism how it was seen as both emanating from this is important you know this is seen as both emanating from and contributing in issues and facilities of transportation of communication and of the military right of british mercantile capitalism

So, there are they are already available many explorations social cultural explorations for instance galileo and his times of einstein of quantum mechanics etcetera from cultural studies perspective **right.**

Ah i can give you second example here you talk about colonial science and the first example in the first example we. So, we given the the example by boris hessen of newton's principia.

In this we also look at how colonial science because of course, colonialism because of course, colonialism colonial colonial theory philosophy and methodology today we we can look back and talk about colonial science at least as it was given to us in our country ok.

As deeply as not something that was again value neutral as not something you know which was sort of untouched right by the by the bigger and the grander framework of colonialism and what it is stood for ok

So, colonial science intersects interfaces with issues of race with issues of class of gender and nation and in india perhaps even cost right and of course, with the broader and you know understanding of what colonial knowledge was at all about how how for instance natives ah you know considered in the colonial setup right

So, you have we have examples here of how you know science and technology are both socially determined and culturally specific.

So, the origins of cultural studies you know as a domain itself this interesting how it is related now we have always spoken of cultural studies as have you know as something that was something that you know came about with the establishment of the birmingham center for cultural studies with with very important scholars like raymond williams richard hoggart and then to hall many of this directors of you know of the birmingham center of cultural studies.

But if we look at it from an epistemological stand point right this is what we also have to acknowledge and it really tries and helps us understand you know why cultural studies is important the way cultural studies came about you know as a reaction to something

So, what was cultural studies a reaction against among other things that it was a reaction against against racial domination that it was a you know reaction against scholars refused to understand the politics of difference feminizing being also very important contributor

to cultural studies and of course, you know structuralism particularly as as we understand semiological criticism in the decoding encoding and decoding of science.

These are the 2 important also additional important the as i mentioned earlier epistemologically these are very important why because cultural studies is often you know you know the cultural studies is you know among all other domains is against to sociology. So, much. So, that many say that there is no need for cultural studies because sociology kind of embraces many of the areas that are discussed under cultural studies.

Now; obviously, cultural studies has a domain has trepan has a you know made all attends to calva it is own needs to say that no we are different domain all together we made a again you know because if you member of first lecture of a second lecture in this series ok

We are talked about we discussed the sheared you know interdisciplinary character on nature of cultural studies and we had said that many event call it a post-disciplinary enterprise right.

So, in that sense we could say that it is it is quite legitimate for cultural studies to if not to borrow then to carry on or to extent some of the domains of study and exploration that have been there either to in areas more established areas like sociology or anthropology ok

So, it is called if let us look at the slide please it is called often an insurgent sociology that is a domain that rebelled against a particular way of looking at society which was the called functionalist way ok.

To see the different parts of society to do see different institutions of society likes say family like education to when we look at these simply in the in the functions as the functions that they for performed there is an additional or maybe to say concurrent tendency right.

To look at you know these very functions as given things that i already given thing with things without which you know you cannot carry on. So, if certain institutions have served purposes in the past and these are institutions that are almost naturalize.

So, cultural studies because it is politically driven because it looks at a issues of power and the politics of difference sort of rebelled against this very notion of functionalism.

This notion of functionalism is also positivist in its epistemology you know a making in that sense also showing that a science is value neutral then those things which have being functional in society can also perhaps be value neutral this is what or this was 1 of the motivation among others for many scholars moving into now for many scholars moving from literate for instance to cultural studies many scholars moving from sociology anthropology to cultural studies.

1 of the reasons could have may be is not to said that there is no descent there is no critiquing in these more established domains, but you know the critic is form of radical the critic is form most strong as far as these domains are concerned second cultural studies also came about as a critic of instrumental rationality

Now, instrumental rationality is you know different forms critical rationality we call we term term areas are methodologies like marxism for instant we label them critical rationality why because they are essentially scientific the essentially rational in their approach yet they are not instrumental ok

Rationality becomes instrumental when there is sort of a technological scientific domination when there is strong bureaucracy that is again base on technologic logical and scientific domination ok

So, cultural studies came about as a critic of instrumental rationality it is not to say that marxism did not critic instrument rationality. In fact, a marxism continued as a critic of instrumental rationality and you are aware that 1 of you know most important sources of inspiration for cultural studies has been you know has been marxism we know that many scholars for instance cultural materialism as given to us by are you know the exemplars here here being scholars like raymond williams and richards hoggart ok

So, 1 of the 1 of the key inspirational forces of methodologies epistemologies if you will has been the critic of an instrumental sort of rationality ok

So, to sum it up really culture studies is seen as as ah originating apart from all other you know all other reasons also seen as originating from a descent or a sharp criticism of instrumental rationality and functionalist sociology.

And they saw the routes of functionalist sociology and instrumental rationality this is very important in positivistic science in positivism positivism was therefore, held's you know was held to be methodology on epistemology that was ah that was responsible for. So, so many. So, many of the problems for instance even colonialism was tied to a positivistic science ok

Therefore the again to move on and an if cultural studies looks at the particular if cultural studies is interested and rightly. So, in the micro labels universes is something that comes into sharp criticism are critic from a cultural studies a methodology or a cultural studies critiquing of science and technology ok

So, what are the questions that we may ask after scholars you know scholars in science technology and cultural studies. So, some of the important questions that we may ask are what social cultural please look at this slide what social cultural and material conditions make the universal in science possible ah.

So, again universes in science are not viewed as we said before as sort of antiseptically call in deaned if i am may use the word from society from social cultural and material conditions the universal itself is depended on and takes on its nature from the material conditions of the production of science and technology ok

Then the second question how do particulars become universals the cultural studies investigation of science as in other domains as we know we talked about this before that it is interested in the particular and this you know the sort of if i may use the upgradation from the particular to the universal is in cultural studies viewed with a lot of suspicion you will agree that cultural studies is perhaps you know we may safely say the domain that a loss for you know great deal of provisionality of knowledge ok.

It is very it has very sharp you know critical i as for as universes are consent in lectures i think 3 to five when we in module 1 when we are talking about science and the scientific the contribution of science of biology to cultural studies and certain universes you recall that there was certain universal that were give you know that a forwarded by

scholars like David Burns for instance made preference predictor avoidance language emotions all these way seen as universals

But and these way come then came from science, but the cultural studies investigation would again even question the. So, called you know establish universals of human beings.

Next we we will call that representation is a key concept in cultural studies already devoted 2 lectures to representation and therefore, cultural studies of the universal not only in science in this case not only scientific universals, but you know, but also universals in the social sciences are interrogated if you may use the word by questioning the very strategies of representation.

How is. So, call universal fact represented right how how is now how does in come about in in the in the first place we are now going going you know after a little while we are going to look at you know scholars were said that equations diagrams graphs and the written word in science are different media.

And they they are different strategies of representation right and if these media are heterogeneity then there is a need to look at how they finally, college to gather to gives certain universal right ok.

So, what is we move on to the forth point which goes like this what are the mechanisms by which the universal is given authorities. So, after looking at the strategies after exploring the strategies of representation of the universal then we also know that that the universal is sort of legitimize **right**.

The the universal you know is given authority now cultural studies would look at this how is scientific universal what are the mechanisms by which these universals are given authority these universals are are given credulity and you know eventually they are thought the become part of galvanize education right

And finally, now the least because this is i think may be as far as cultural studies properties concerned could be the most important point here.

The last point to what use is the universal put we have we have a universal we have represented it with certain strategies of representation by some social mechanisms and

pedagogical mechanisms we have made the universal canonize we have canonize a universal and we have given it authority right

Finally what you know this authority and power that the universal has right to what uses are it put what uses are these universe are they put sorry are these universals put. So, if you if not see science for instance in the time of hitler gave some universals some universals regarding certain races as been you know superior to other races ok.

Then we will have to we shall have to see we shall have to see how how those universals will agree we went into what was the kind of science in practices in the times of mechanisms that would give rise to an idea of the ideal of the most superior among all human beings.

That most superior race which would read also to the extermination of some races some peoples in the in the world now the monetize say axis science and the cultural exploration of axis science it is easy perhaps for you to you know to to accept it why because you knew that the you know terrible excess of narcissism was. So, wrong were. So, very unrespectable ok.

Ah what is more difficult is you know to as scientist you are a scientist and technologist what is more difficult is to be self reflexive and to you know to look at your own work as also socially determined or also culturally determined and also as its last point put point here being put to certain uses right ah

Among i would say among no if not all among most of the domains that your studied. So, far an you are going to study in cultural studies in the course in cultural studies watch watch should be of most interest and used to you is the cultural studies investigation into science and technology. So, so far what have we found we found that like s t s or you know science technology and society studies

Also s t c or science technology and cultural studies looks at science and technology or or technoscience as culturally determined culturally conditioned socially determined have in strategies of representation there been mechanisms of giving authority and powered to you know to science and technology and particularly to universals. So, much. So, that at the. So, called universals are seen to be infallible and value neutral **right.**

And of course,. So, also have to see to what users are these you know science and technology products put. So, these are essentially you know the key **focus** various of cultural studies investigation into science and technology right

Therefore the come up with an important proposition like these cultural studies says that scientific reason to by which you know all about which we have many of us have an you know unfailing trust **right.**

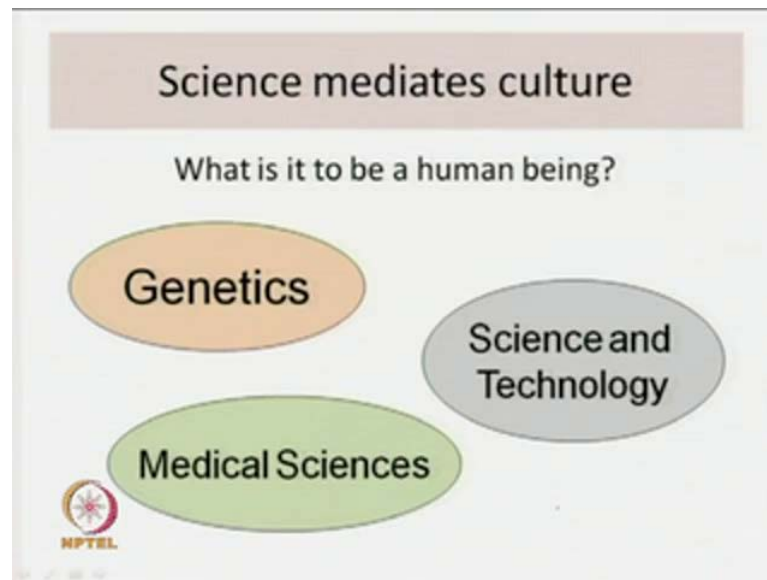
Which is in many ways a given to all of us is also known as you may find this little difficult to difficult to accept, but when we say that scientific reason is also cultural belief right many would even be more radical and go on to call it a myth **right.**

But if it is a cultural believe it means this it does not mean now this is the very important many would like you know. So, **so** to speak the show the baby out with the bath water and say the oh scientific reason is just believe like many other things for instance it is just a myth, but when we say that scientific reason is a cultural belief what we mean is it is culturally and socially determined **ok.**

And this is something that you you know increasingly even many scientist right are beginning to explore they are these areas interfaces between science and philosophy between science and sociology between science and anthropology and science and and science and cultural studies.

There are many scientist as well is philosophers they are also people from literature for working in the interfaces you know between science and respectively all these other domains

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Now, as far as the construction of identity is concerned you know that identity and subjectivity are again to like representation to very important concepts they are they form the key concept among are the concept in cultural studies and cultural studies exploration of science and technology also points to the fact that issues of identity and subjectivity of ourselves as human beings is also tight to science and technology.

Functions if we ask a question like this what is it to be a human being now there are of course, many ways of defining what a human being is is, but from the point of view of science and technology and also to a large extent right unless 1 is arguing from a religious point of view right

The from a large extent human being is understood increasingly in terms or in the discourse of genetics in the discourse of general science and technology and and of course, importantly in the discourse of the medical sciences.

So, what is it be human being what are subjectivities and identities how they are coughed out these are also these answers are increasingly being sort in this definition of sort in genetic medical sciences and science and technology right.

Ah this lecture would not really the complete if we did not bring in you know 2 very important philosophers of science who whose was has contributed not only to the philosophy of science to the also to in a to social studies of science and technology and

to cultural studies of science and technology in the sense that they were you know they they they was very important because say they tried to shed light on science as an enterprise ok.

On the epistemology of science on the methodology of science the interestingly both popper and kuhn again were. So, different in their formulation ok

Now, where is for instance if what was he what was he way of you know the traditional way of looking at science you remember just few slides go we have found that the traditional way the positivistic right.

The positivistic way of looking at science or positivistic science considered science as progressive as linear considered you know science has sciences growing in you know in in which each new thing was you know as a given better than the previous finding.

Popper karl popper as a philosopher of science talked about falsification as a method of the narrative of science of the method of scientific progress and he says that it science does not happened by convergence, but it is happens by divergence.

He says that you know they has to be a falsification your theory would have to be falsifiable in order to be deemed a science at all now many find this little paradoxical if it is falsifiable right and how is it science, but popper would says the that is in the very nature of science.

And by doing this by the falsifiability tests he was performing a very important or making a very important contribution you know particularly in when we when we talk about science and religion when we trying differentiate science and religions are this helps us a lot ok.

If you look at religion religion cannot be falsified you either believe in it are you do not you are either a believer or a not a believer or in some cases you are agnostic the which is something in between ok

But because religion is not falsifiable it is not scientific and many who do not believe in religion would then go on to say that because religion is not falsifiable because therefore, it is not science therefore, religion cannot be knowledge religion that is the difference

between knowledge and religion sorry between yes between knowledge and belief sorry between knowledge and belief sorry between knowledge and belief.

And for something to be knowledge you have to understand in the first place as cultural studies would be quick to show you would understand that it has definitely it has professionally in nature and it has to be falsifiable.

Now, we come to a very important point just because knowledge is professional just because science is falsifiable does not mean that it does not work right there is a difference we agree you know we agree to believe or to accept the fact that science is falsifiable.

According to Karl Popper and that that you know its trajectory is a divergent 1 right we agree that science when other forms of knowledge are professional, but we also agree at the same time that is the best we have something that is put to the test something that is reliable is something that works **right**.

On the other hand religion because it cannot be put to the test the belief in God ah something that we are the have or we do not have you cannot put it to the test would you follow in that case many would say that it would also it would not you know not be knowledge in the first place.

The other important philosopher as you saw was Thomas Kuhn according to which according to whom science progresses by paradigm shifts and if Popper was Popper talked about diverging of science Kuhn refers to the trajectory of science being a convergent 1 **right**.

And he explained you know the the journey of science not simply as a you know as a linear progressive 1 where yesterday's science is better you know was not better than today's science.

Ah like Popper whose falsification theory you know made us question this old traditional linear way of a looking progressive looking at science Thomas Kuhn's paradigm shift also showed that there was this is you know that journey of science was punctuated by if I may use the word punctuated by this very important shifts for instance I give you an example.

Newtonian mechanics would be a paradigm the next important paradigm would be Einstein and the theory of relativity after which if we are to locate this and we would have to say that it is a convergent you know Kuhn believed in the convergent trajectory of science.

So, we found here that Popper and Kuhn even though belong to are they important in questioning the positivist the positivist to you know understanding of science and they are appropriated by scholars and ah science and technology and society studies the cultural studies investigation of science is deeply intended to the work work of Karl Popper and Thomas Kuhn

Next tells also what is called today the critique of big science the critique of big science and what is big science is you know big science refers to huge of mega project in science **right.**

Ah where there are you know there scientist that who belong to different parts of the world who take up segments of the projects and you know they the question here is the testimony being given by people. So, far-flung in different parts of the world.

and there way of knowing and finally, contributing to the mega project cultural studies are the critique of big science would look at the gaps there in there is a trust of course,, but they would say that this very trust which was hallmark of science. So, far is something that is critique **right.**

So, we have mega projects in science international projects in science whose the gaps of knowledge and even as people contribute the interstices. So, to speak in them or not considered.

So, let us look at a few questions here for instance if you get a question like delineate the scope of cultural studies of science and technology you would answering the following way you would say that the study the cultural studies investigation of science and technology may be studied on the 3 broad domains an these are science as culture which lead us to talk about the cultures of science.

Now, again I said the cultures of science or we do not mean scientific cultures scientific only scientific spirit what we also mean are you know as we understand culture in culture studies.

Culture as a way of life a and b the the science and the you know codes the encoding of codes in science for instance I said how equations and science written out in language diagrams right this is what we deal through.

Diagrams then graphs and you know what we what is called the activity operational right how these all coming together. So, there is also a sort of you could say linguistic if I may use the word linguistic exploration of science.

Finally science and technology and the way it has shaped culture and the way it has shaped culture also include sorry includes issues of identity and subjectivity how identity and subjectivity are in human beings are created for instance moments explain and define the human being as a from the point of view of genetics from the point of view of medical sciences **ok.**

From from the point of view of technology then you are building subjectivity and an identity which is increasingly you know informed by the finding of science and technology.

why are people increasingly doing this people do this or have a propensity towards doing this why because sciences shown to be value neutral science is shown you know to be isolated findings which are not related you know to vision which cannot be condition by by, but in the case of Newton's for instance his Principia we found that how it contributed to British mercantile capitalism and in the same at the same time was informed by it **right.**

Finally last question how this technoscience mediate subjectivity there said se technoscience mediate subjectivity if you ask a question what is it to be a human being increasingly answers are coming from the medical sciences from general science and technology and from genetics.

So, you know as with many lectures and as with many on many occasions well we have again just being able to unpack science and technology studies my hope is many of you

would go on to read important books in science and technologies i hope that this lecture has been able to motivate you to look at your own work as scientist and technologies to ask you know to to boldly accept facts of science are not value neutral that it is deeply escorts if not determent by society and culture.

Thank you. So, much and we shall meet in the the next lecture