INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

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NPTEL ONLINE CERTIFICATION COURSE
An initiative of MHRD

Science, Technology and Society

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Then we discuss the symbolism of intellectual property sciences okay I must reiterate that there must have some way of thinking about the distinctive equivalence in the domain of science of income meant and wealth and property found in the economy globally how do you scientist manage to perceive one another simultaneous sphere and edge unequal in the sense of something first among equals what is the distinctive nature of intellectual property.

It is also a part of the way the world of science is structured okay in the in the river coexisting most important mode of production that is evident okay as you well know like there are various modes of production there are various stages in the development of societies ranging from the hunting and gathering economy it is also popularly known as the primitive including up in primitive community more primitive communist society of living primarily communal society okay.

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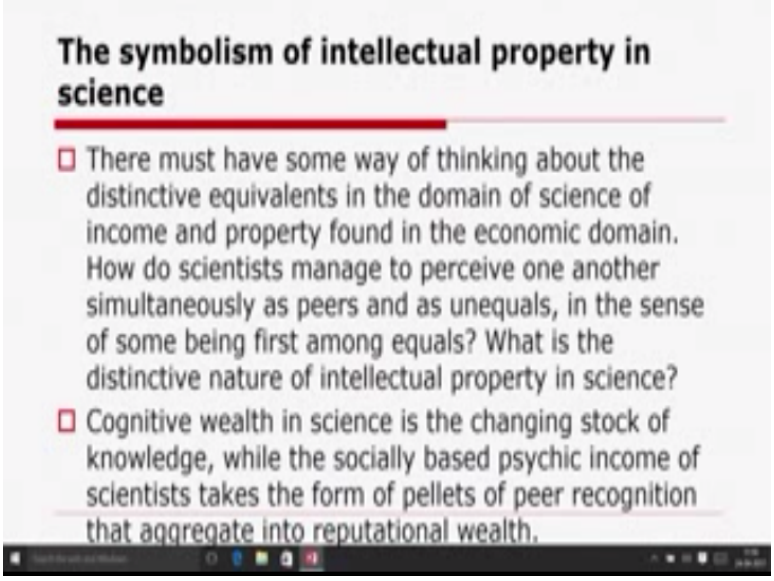

I am not using primitive because it is also a colonial construct that is that is a different story altogether okay let us see these terms hunting and gathering economy in the slave society the feudal society and the capitalist society okay which marks the envisioned that which will unstoppably and unavoidable okay move on to socialism and thereafter community that is the big difference cases all together okay which, which are very important in the context of social theory.

But in the context of HTS that we are discussing here okay we will discuss the way scientists manage to perceive one and other simultaneously as peers from the one hand and as unequal from the other in a capitalist structure and the world of times is also not an exception to this you know it in the sense of being in the sense of some being first among equals what is the distinctive nature of such intellectual property in science okay intellectual property in science.

It is also historically conditioned our last module last towards the end of our lecture intercourse okay we will find intellectual property rights regime in the world as well as in the context of India okay then cognitive I mean well but, but in its generality and I am talking about intellectual property in science in the context of ownership over scientific knowledge restriction of scientific and technological development for public image okay and so on and the cognitive wealth in science is the changing stock of knowledge while the socially based the socially based psychic income of scientists takes the form of pellets of peer recognition that aggregate into reputational wealth.

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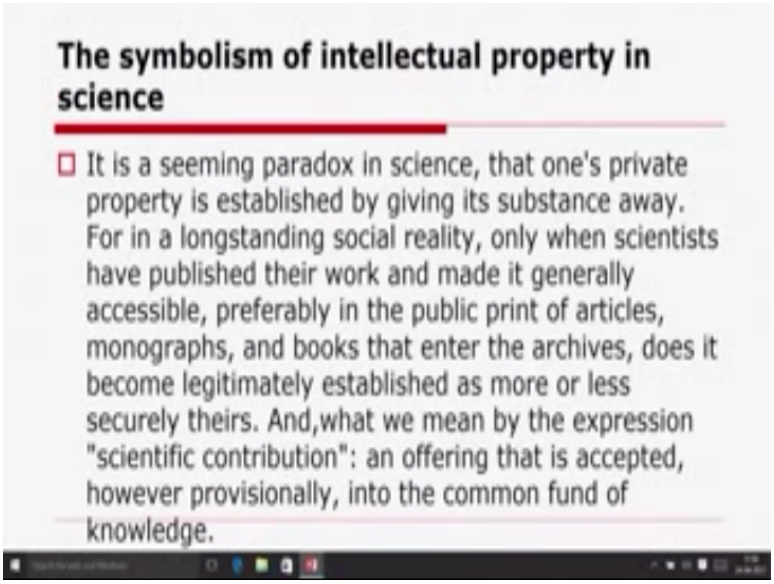

And this concepts and directors okay direct directors to the question of the distinctive character of intellectual property that is okay it is a silly paradox okay which we started with mortal work on cumulative advantage in science okay that one private property is by giving it substance away for in a long-standing social reality only a very scientists have published their work and made it generally accept accessible preferably in the public prints of articles monographs and books that enter the archives does it become legitimately established as more or less securely there okay.

We that mean not started with that that for in a long-standing social reality I mean I mean we read oftentimes that one private property one is intellectual property in established by giving its substance away by giving me the easier research choice okay by letting others know about that distinctive records okay for in a long-standing social reality all given scientists are published their work of repute and made it generally accessible preferably in the public prints of articles monographs and books in the form of publications that enter the archives does it become at that time only it becomes legitimately established sense more or less securely.

And what we mean by the expression of scientific contributions that is an offering that is accepted however provisionally in the common fund of knowledge common property of resources but what is government property resources are getting different from this one common foe but, but will liquid set see it okay when we discuss idea Reggie intellectual property rights regime as such okay.

Okay then when we will say that the scientific contribution when we talk about scientific contribution which refers to an offering that is usually accepted but provisionally into the common fund of money who suggested with first that if we accepted if our hypothesis is tested right you must corroborate it if we must accept a provisional because under all other circumstances we have not tested our hypothesis to be right or wrong okay.

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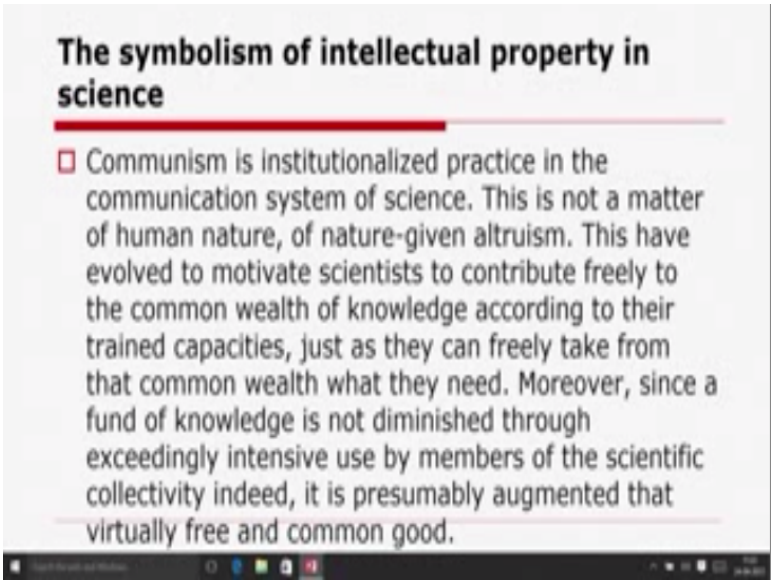

And if one single instance may test your hypothesis wrong let us say we must keep our scientific contribution okay in the form of acceptance but provisionally into the common fund of knowledge what community I mean that that crucial mean if common point of knowledge if we look at that crucial element of free and open communication is what Martin has described as the norm of community meaning the social institution of times if you can slightly recall we discussed because of modern science I mean namely universalism community disinterestedness sand organized captivity okay.

In this sense the crucial element of free and open communication is what Martin described as the norm of community in the social institution of science I mean it was of module science okay empirical sciences which Bernard barber going onto propose the less conventional term community indeed long before the 19thcentury with it Marx adopted the watchword workers of a fully realized community communist society from each according to his abilities to each

according to his needs this was institutionalized practice in the communication system of time okay.

I mean what Mark said I mean if you go back to the stages in development of society or the moves of production which we have discussed I mean hunting-and-gathering economies slave society feudal society and then capitalist society which will unstoppably move on to socialism and thereafter communism okay the way mark suggested that hunting-and-gathering economy version was based on some kind of community relations private property.

I mean honestly over many resources by a few individuals by a few groups okay in fact originated through the slate Society okay through the slave Society and feudal society and now capitalist what is the difference between the slave society the feudal society and the capitalist society on the one hand and hunting and gathering economy and socialism and community the slave society the feudal society.

And the capitalist society they are class societies whereas the first the hunting and gathering economy and the last two I mean socialist society and communist society they are not they are not classified what were classes according to Marx that we have just now discussed classes according to Marx as manifestations of economic differentiation classes are not based on our classes are based not on income but on the position that one occupies or the functions that one performs in the process of product okay.

But you will not find that is why I gave you this example further for example there are two blocks makes one an owner and the other of paid workers then both belong to two different classes not one okay you will not find that kind of a relationship okay in hunting-and-gathering economies or in socialist society or a community society for not then what is the difference between hunting and gathering economy on the one hand.

And socialism and communism in on the other hunting and gathering economy was not an organized economy was not an organized society where the production was not organized okay where as in socialism and communism okay production is organized somebody may say that in capitalism also production is organized capitalism production is organized in socialism production is organized in community production is organization okay.

But the owner is name that you find in capitalism in the hands of a few individuals or a few groups or a few ellipse okay that ownership will be transferred to the state or the or the proletarian or the working classes in socialism encouraged then what is the difference between socialism and communism then Martin is a shooting mentioning here is quite incisive in mentioning yet that in sociology each will be contributing according to he or her capacity and will be failed according to he or her work okay.

I mean in socialism each will be contributing according to his or her capacity or ability and each will be failed according to his or her work whereas in community each will be continually according to his or hers capacity and will be paved according to healer her need okay let us say long before I mean the 19th century long before the 19th century Marx adopted the watchword of a fully realized community society from which according to his ability to I mean work to each according to his or her needs this was an institutionalized practice in the communication system of science okay.

In fact in fact this is very important to understand this okay I mean when we look at this that the transition from each according to his ability either her abilities to each according to his or her leads okay this is not a matter of human nature or nature given alternative that is the community means an institutionalized practice in the communication system of science.

This is not a matter of human nature or of nature given order to each okay which traditional arrangement have evolved to motivate scientists to contribute freely to the Common wealth of knowledge according to their trained capacities just as they can freely take from that Common wealth that they need more over since the fund of knowledge is not diminished through excessively intensive use by members of the scientific community collectively indeed it is presumably augmented that virtually free and common good okay.

Then such institutional arrange arrangements which has evolved to motivate scientists to contribute freely to the Commonwealth of knowledge common fund of knowledge as we have discussed earlier according to their trained capacity just as they three we take from that Common wealth what they need more over since center fund of knowledge sensor common fund of knowledge is not diminished through exceedingly intensive use by members of the scientific collectivities indeed.

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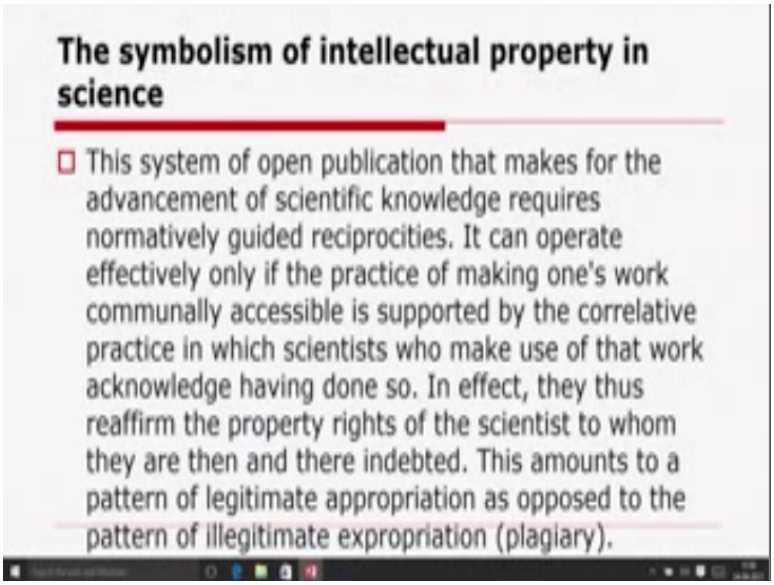

It is presumably augmented that virtually free and a common good is not subject to the tragedy of the science in an environmentalist argument the tragedy of the Commons which and discussed as a not as a prospect or a remark but what is when we when we will wrap up this discussion will discuss common I mean the tragedy of the Commons okay I mean in fact in the power over those common that that common fund of knowledge okay or the power over resources the power over common property resources okay.

The power over natural resources and had in reality being translated into the power over people okay I mean what Twitter the tragedy of the Commons is the term coined by Garret Howdy okay no I mean first the erosion what is what is that the tragedy of the Commons I mean first the erosion and then the destruction of a common resource by the individual is external and

collectively irrational exploitation of it individually rational and collectively is it individual profit but correct is loss.

That is tragedy of the comes in the Commons of science it is structurally the case that the given the take both war to enlarge the common this also accessible knowledge okay then I mean are you able to follow what I mean that that the kind of now that that is that fill of common fund of knowledge is not diminished through exceedingly intensive use by members of the scientific collectivism of course it is presumably augmented by virtually free and common good okay which is not subject to what yet Harden has partly analyzed now as the tragedy of the Commons the tragedy of the Commons I repeat I mean it refers to first the erosion and then the destruction of a common resource by the individual rational and collectively irrational exploitation of those resources communism okay.

I mean individual profit and collective loss individual profit and social nodes individual profit and national knows okay and if the communist of science it is structurally the case that the given the take given the taken in the quid-pro-quo system given decree in the Commons of science it is structurally the case that the given the take both work to enlarge the common resource of accessible knowledge okay.

The structure the structure and dynamics of this system are reasonably clear since positive recognition by peers is the basic form of extrinsic reward in science all others extrinsic rewards such as monetary income from science connected activities advancement in the hierarchy of scientists and enlarged access to human and material scientific capital derived from it okay but obviously peer recognition can be widely accorded only when the correctly attributed work is widely known in the pertinent side community along with the motivate in intrinsic reward of turn okay.

I mean, I mean, I mean along with the motive motivating intrinsic reward of working on a system with scientific problem and solving it this kind of extrinsic reward system provides great incentive for engaging in the often arduous and tedious labor required to produce results that enrich the attention of qualified peers and are put to use by some of them.

And this system of open publication that mix for the advancement of scientific knowledge requires normatively guided reciprocity okay we have already known you know we have already

discussed what is the normative institutional framework of sign structure of science okay in the context of ethos of money it can operate effectively only is the practice of making one work communally accessible is supported by the correlative practice in which scientists who make use of that work acknowledge having done so in effect they just reaffirm the property rights of the scientist to whom they are then and they're indebted this amounts to a pattern of legitimate appropriation as opposed to the pattern of in legitimate expropriation that is called pleasure.

Okay then when we look at this system of open publication which makes for the advancement of scientific knowledge that require normatively guided reciprocity in orbital guided framework institutional history internal structure okay it can operate effectively only if the practice of making one's what communally accessible is supported by the correlative practice of making one's work.

I mean, I mean it can operate effectively only the practice of making soup making one source communally excessively supported by the correlative practice in which the practitioners of science who make use of that work acknowledge having done so in effect hey reaffirm the property rights of the scientist I mean intellectual property rights of the scientists of the practitioners of science to whom they're often them in their indebted.

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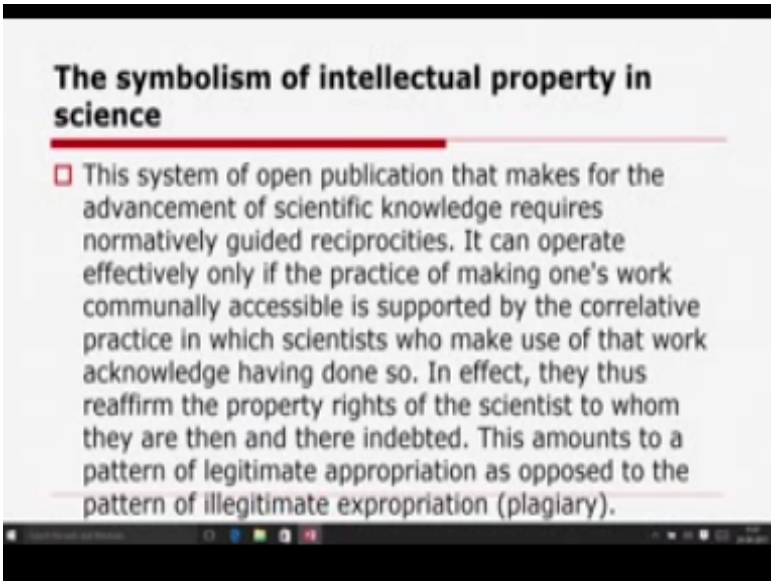

And this amount to a pattern of legitimate expropriation has opposed to the pattern of in legitimate expectation and in reading the case of pleasure okay.

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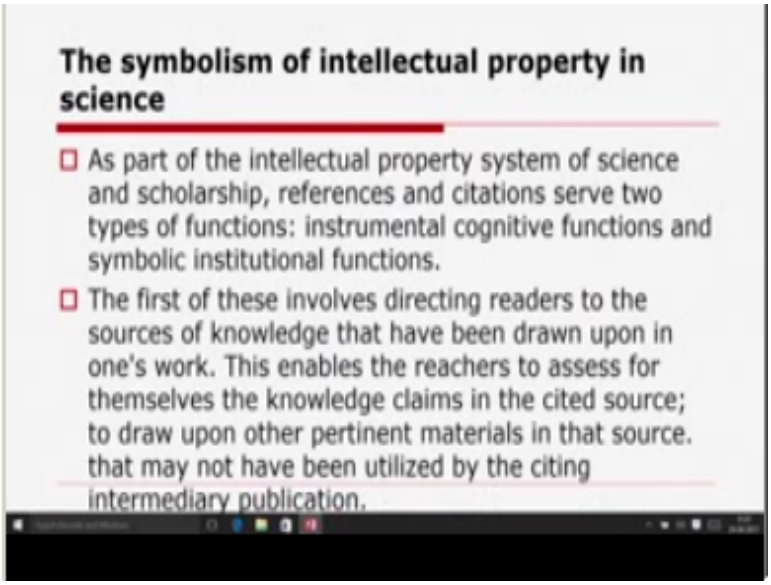

We just begin to see that the institutionalized practice of citations and references I mean what is that plagiarism I mean when you quote somebody without acknowledging the sources okay you sighs somebody without acknowledging the source okay and as part of the intellectual property system of science and scholarship okay I mean we I mean we then begin to see the institutionalized practice of citations and references if the sphere of learning okay is not a trivial matter in it is very important why many a general reader that is the ladies are located outside the domain of science.

And scholarship may regard the lowly footnote or the remote End Note or the bibliographic parentheses as a dispensable nuisance it can be argued that these are in both central to the incentives and systems and an underlying sense of distributive justice that do much to energize the of knowledge okay then as part of the intellectual property system of science and scholarship the references and citations are two types of function one instrumental cognitive functions.
And secondly symbolic institutional congress one is instrumental cognitive functions I mean it must have an objective and symbolic okay that you acknowledge the source the first of being the first one I mean the instrumental cognitive function okay it involves directing readers to the sources of knowledge that has been drawn upon in one spark okay this enables research-oriented readers is there.

So minded to assess for themselves the knowledge claims the ideas the findings in the cited source to draw upon other pertinent materials in that source that may not have been utilized by the citing intermediary publication and to be directed in turn by the cited work to other prior resources that may have been obliterated by their incorporation in the intermediary objective okay but citation.

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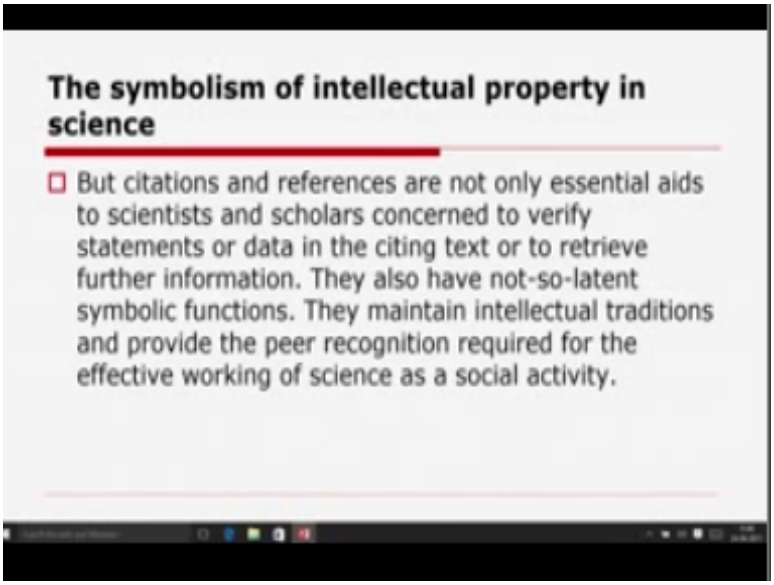

But citations and references are not only essential edge to scientists and scholars concern to verify statements or data in the citing state in the sitting of texts or to retreat further information they also have not so latent embolic functions the mental intellectual tradition and provide the peer recognition required for the required for the effective working of science as a source of activity okay we must not try to look at many walks in fact nothing of Newton and others.

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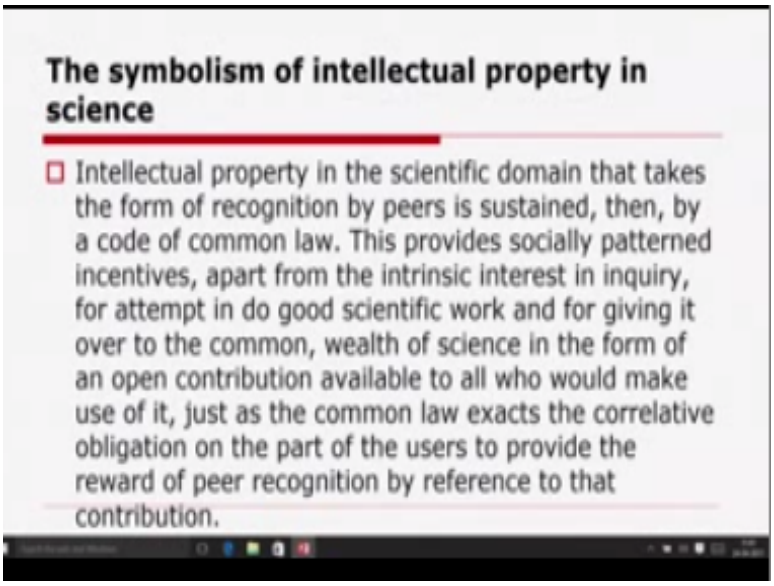

And then and then the kind of study that Martin along with Harriet's Ackerman carried out okay they have taken note of how Hindi Oldenburg the editor of the newly I mean the editor of the transactions of the Royal Society in 17th century England induced the emerging new breed of scientists to abandon a frequent long-standing practice of sustained secrecy and to adhere instead to the new form of free communication through a motivating exchange open discloses in exchange for institutionally guaranteed honor defeat property right in the new knowledge given to understand that that historical evolving set of complementary role of legacy has taken these institutional wrote a composite cognitive.

And moral framework called for the systematic use of references and citations as with all normative constraints in society the depth and consequential force of the moral obligation to acknowledge one sources become most evident when the normal violated and the violation is publicly visible okay.

If you do cite some sources okay and then it amounts to plagiarism now it is it amounts to unethical conducting in fact in research the failure to cite the original text that one has quoted at length and or draw up and becomes socially defined as theft as intellectual loss lessly or as it is better known since at least the 17th century as places Lesley involves expropriating the one kind of private property that even the dead about abolitionists to private productive property as Martin mentioned Karl Marx specially to be regarded as inalienable as witnesses refers to the first edition of capital.

And in further thundering on the subject throughout the travel is energy one to recapitulate the bibliographic note the reference to a source is not merely a grace note affixed by way of either date ornamentation that is that it can be so used or abused there is not of course negative code units the reference serves both in both I mean the reference are both instrumentals and symbolic functions in the transmission and enlargement of knowledge instrumental okay I mean both instrumentally as well as symbolic okay instrumentally it tells us of what we may not have known before some of which may hold further interest of us on.

The one hand and symbolically it registers in the enduring archives the intellectual property of the acknowledged source by providing pellet of clear recognition of the knowledge clay accepted or explicitly rejected that was made in that source intellectual property in the scientific domain that takes the form of cognition or sorry.

Let us reason by Pierce is sustained than by a code of common law this provides social effective incentives apart from the intrinsic interest in inquiry for attempt in do good scientific work and for giving it over to the Common Wealth of science in the form of an open contribution available to all food makings of it just as the common law exact the correlative obligation on the part of the users to provide the lure of fear recent by reference to that contribution.

Okay I mean what Martin tried to look at I mean such intellectual property in the scientific domain provides socially patterned incentives apart from the intrinsic interesting inquiry for a tempting room in the in doing good scientific work and for giving it over to the common I mean this research may be very empirically influenced but the kind of reward system the kind of holistic pattern that it has okay it is extrinsic in nature okay not increase okay.

Thereby he they tried to go on that how intellectual property in science provides socially patterned incentive okay apart from the intrinsic interest in inquiry for attempting doing good scientific work and for giving it over to the Common Wealth of science in the form of an open contribution available to all who make use of it just as the common law exact the correlatives obligation on the part of the users to provide.

The doers of peer recognition by reference to that contribution let us say how much I'll try to provide such an examples like deep space around which happily for you it does not I would exam in the special case of tacit citation and of obliteration by in comparison or the opiate

addiction I mean of the sources of ideas methods or findings now by their being anonymously incorporated in current canonical knowledge okay many of these cases okay.

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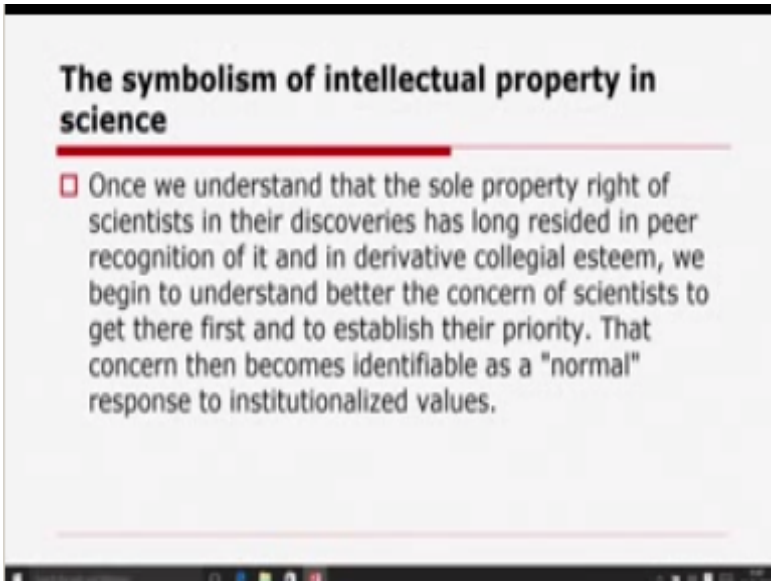

Many of these cases of seemingly acknowledged or many of these cases of seemingly unacknowledged intellectual date it can be sold are literally exceptions that proves the rule that is to say there are no exceptions to all since the references however tested are evident to knowing pH once we understand that the souls property right of scientists in the discovering has long resided in ear recognition of it.

And in derivative collegial system we begin to understand better the concern of scientists to get there first and to establish their priority that concern then become identifiable as a normal response to each tissues analyzed values and the complex off and the complex of validating the worst of one work through appraisal of competent others and the seeming anomaly even in a capitalistic society of publishing.

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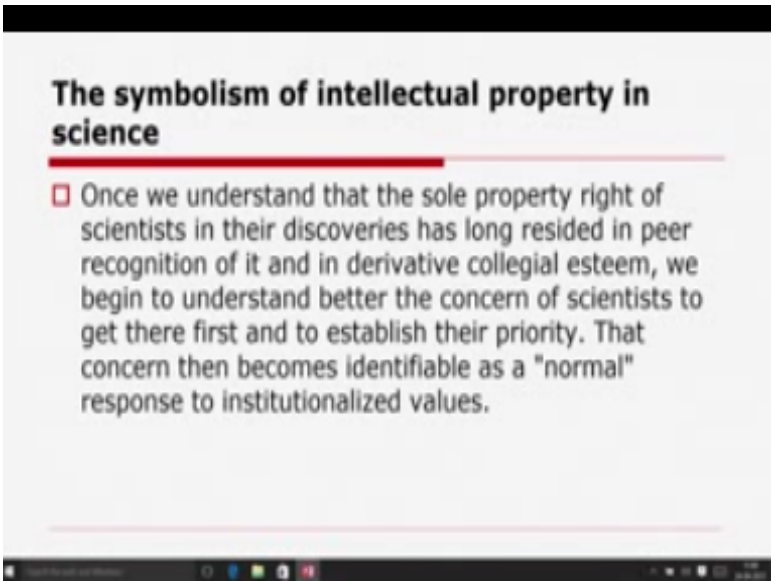

Once or without being directly recompense for each publication have made for the growth of public knowledge and the eclipses of private tendencies toward Hodel private knowledge I mean that is secretly ok secrecy is called ok in time I mean should be cool ok still much in evidence as late as the 17th century current renew tendencies towards secrecy and not alone in what Henry s Covey's has described a entrepreneurial science will if extended and prolonged introduce major changes in institutional and cognitive workings of science since mortal has imported not altogether metaphorically such categories as intellectual property psychic income.

And human capital into this account of the institutional domain of science it is perhaps fitting to draw once again upon chief of the type of economists or a last word on our project ok on the project which Martin carried out ok let me quote now Martin here let himself and in an inveterate observer of human behavior rather than only of economic numbers and also himself a practitioner of time so keep green the memory of those involved in the genealogy of an idea Paul Samuelson clearly distinguishes the world of scientific film from the breadth of popular celebrity this is how he concluded his presidential address of I mean I mean almost thirty years a grow hat wrong I mean I mean in 63 62 or63 in 1962 or 63 that let me quote Paul Samuelson here as quoted by Martin not for us is the limelight.

And the applause of the world outside ourselves but that doesn't mean the game is not worth the candle or that we do not in the end we live in the longer the economic scholar works for the only coin was having our own approach okay I mean then it is very important to understand that once

we understand the sole property right of the practitioners of science in their discoveries has long resided in clear recognition of it and in derivative collegial system.

We begin to understand better the concern of the practitioners of science to get there first and to establish their private that concern then becomes identifiable as a normal response to institutionalized values okay when I say institutionalized values I mean the complex of validity the worth of one work through appraisal of competent others.

And the seeming anomaly even in a capitalistic society of publishing one's worth without being directly composed for each publication have made for the growth of public knowledge and the eclipses of private tendencies toward holding private knowledge okay let it secret spill much in evidence as late as the night 17th century okay and then what we have discussed still you know we I mean in this module okay we started with the inequalities in science okay in terms of the massive effect in science the G word and communication systems of science.

Okay then we have discussed the Matthew effect in its generality how psychosocial processes affect the allocation of rewards to scientists for their contributions and allocation which in turn affects the flow of ideas and findings through the communication networks of science and such conception and is based on an analysis of composite experience reported in the Ackermann interviews with Nobel laureates in the United States there we have discussed the real system enzymes the matching effect in the reward system the nightly effect in the communication system the method insteps and the functions of functions of redundancy.

And the social and psychological basis of symmetry effect and the messy effect and allocation of scientific resources and then after 20years model tries to provide an account of net effect in science not in the form of reward and recognition but in the form of cumulative advantage and the symbolism of intellectual property okay it's cumulative advantage in x then we discussed intellectual property in science then the material affecting its generality then the way the world of science is structured unequally okay now we're at the bottom you find more scientists with a few viewers.

And recognition and at the top you find a very few scientists that mode word tentatively since the world of science appears to be unequally distributed okay let we have discussed how a world is how the world is peculiar in this matter how it keeps grading it tends to give the credit to already

some people for example a price will almost always be awarded to the most senior researcher involved in a project even if all the work was done by a graduate student okay.

Then we have discussed accumulation of advantage and disadvantage among the young scientist the junior scientist the graduate students the PhD research scholars and so on then we have discussed accumulation of advantage and disadvantage among scientific institutions okay then we post then the then Martin the way he posed the question if the processes of accumulating advantage and disadvantages are true here to work why are there not even greater inequality than have been found to obtain okay.

From there on Martin tried to look at countervailing processes and then the symbology mean of intellectual property in sconce, okay then quickly we will try to first review okay, before getting into technology and politics okay, then from the very beginning we started with the ontological questions concerning science technology and society okay, I mean all philosophical questions okay.

What is technology suppose, technology is the medium through which human beings interact with nature when I say nature it includes both natural and social phenomena, thereby I try to widen the scope in ambit of technology okay, what is science, science is an inquiry into the nature and limits of a particular knowledge okay, when I say nature I mean the scope embito science when I say limits by limits I do not limitations by limits I mean under what limiting condition science is practiced or perspective okay.

Then we discussed various perspectives on the relationship between science technology and society okay, namely we started with the linear or hierarchical model then the interactionist model and then embedded model okay, there we discussed how technology is not neutral now the neutrality of technology depends on the way a particular technology designed and control there we discussed the construction of the New York bridge by Robert Moses in the 1917 which reflects I mean the design of that bridge reflect.

The design of that bridge of the New York region itself reflect racial prejudice and class bias on the part of Moses and then we discussed from the ontological questions to the more normative question. What should we okay, what not to be okay, there will discussed the normative structure of science by Martin if of modern science namely universalism, community, disinterestedness

and organized skepticism okay, from there onward what he did but what he acts take to be okay, with such inequalities which persist and those ethos of modern science are expected to overcome such inequalities in the form of, suppose in the form of community.

And such inequalities in my design we have discussed in terms of rewards and recognitions, in terms of cumulative advantages in the form of in the in the form of symbolism of intellectual property and so on. From now onward what we are going to do we will discuss the way to processes to forces of production okay, namely technology and politics when I say politics we may even look at it as a combination of economic culture and politics okay.

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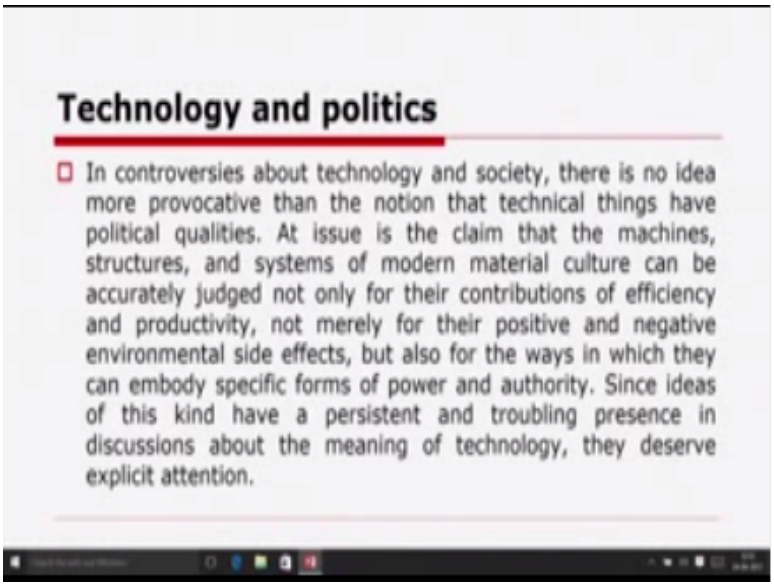

Now because when we discuss this we will first start with technological stepping of society it is the general common view that no as if technology determines what kind of certain of an economy or a culture or quality we are going to have okay, as against this we also have social stepping of technology okay, why we say that no the technological stepping of society is not attainable it is untenable.

Precisely because if a particular technology determines everything if computer determines the way US is designed today then the computer would also have designed India that way but they are different right, I mean it is a particular technology also is incorporated in a specific social

economic and political context, cultural context, institutional context, ethical context, legal context, ideological context.

We are going to discuss these this aspect okay, in the lectures default. Now when we look at technology and politics and their interrelationship okay, in controversies about technology and society there is no idea more provocative that the most of the technical things have political proper quality or property and I am banking on land on wheelers article do at effects of politics at it so is the claim that the message structures and systems of modern material culture can be accurately judged not only for their contributions of efficiency and productivity not merely for their positive and negative environmental side effects.

But also for the ways in which they can embody specific forms of power and authority, since ideas of this kind have a persistent and troubling presence in discussions about the meaning of technology they deserve explicit attention okay. Now let us see first technological stepping of society, what is what does it refer to, what does technological determinism refer to, what does technological stepping of society refer to?

Technological determinism refers to the fact that any kind of change which is happening okay, can we must be, should be attributed to the way technology incorporated in our economy culture and quality. Then technology becomes the cause and changes in our economy culture and quality they become the effect okay. Now for our understanding okay, if this is the case then technology will be a universal phenomenon okay, if technology is a universal phenomena becomes a universal phenomenon okay.

What kind of problem it can happen okay, I am not bringing about the critical technology in the ways suppose a person from the world of theological approach, I am bringing about this critical technology from the advantage point of HDS from the advantage point of philosophy of science, history of science and sociology of science okay, I am trying to bring about a linear model of, I am trying to bring about the critic to the linear model of the development of technology okay.

In this case how technologies can step society, what is, how is, how can a particular technology influence society, we have seen when computers were introduced in India okay, India also faced so much of unemployment or anything but now we cannot think beyond computer I mean we cannot think independent of computation okay, it is very important I am not denying we are not

denying, what colors of HTS they have been trying to do, they have been trying to locate technology in a specific social and political context.

Therein lies the significance of such debate on how technology is politically manual, economically determined socially and culturally influenced and whether let us what we have already discussed whether a technology is neutral or not depends on the way it is designed and controlled okay, neutrality of a technology can be judged by this by these two aspects whether a technology how a technology is designed and how a technology is controlled honestly okay.

It is not simply important that how technology what is the contribution of technology okay, the contributions of any technological system may be feeling in the form of efficiency and productivity, may be still in the form or you can say that technology may be evaluated in terms of positive and negative environmental side effects. But more importantly a technology must be evaluated in the ways in which a particular technology can embody specific forms of power and authority okay.

In rudimentary sociology there is a difference between power and authority as you have discussed earlier authority is legal where those power is not okay, but we are using these two terms interchangeably here for the time being but keep this in mind that the power and authority they are not same okay. When we talk about this specific form of such specific forms of power and authority embedded in the designing and controlling of a technology okay, then such a certain persistent and troubling presence in the discussions about the meaning of technology will be witnessed and perhaps for this reason it is our deserves explicit attention.

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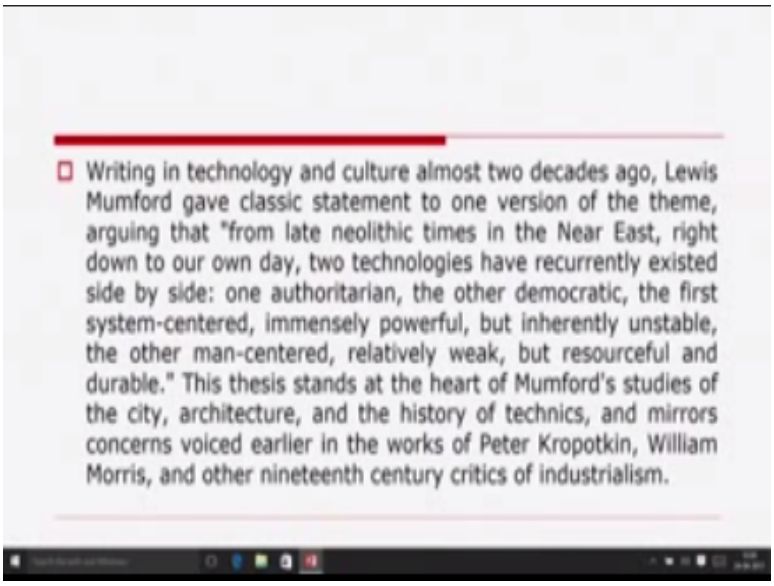

If you look at this Landon winner try to provide you know I mean he tried to look at Lewis Mumford articles I mean in technology in culture which appeared in the 1960's, 70's okay that bloom forgives classic statement to one version of the theme arguing that from late Neolithic in the near East right down to our own day two technologies have recurrently existed side by side, one authoritarian the other democratic.

Then how a particular technology brings in the structures of power and authority would okay, one technology is authoritarian and the other is democratic. The authoritarian technology system centered state center is propagated by the stating sponsored by the state is immensely powerful because of because it because it has been sponsored by the state okay, but inherently unstable okay, it is because it does not take into consideration many other factors will come to this okay.

Let us first see what is the other kind of technology, a more democratic which is human center but relatively weak but resourceful and give them look into the kind of dam project related to large dam project related to Narmada bucha one though okay, that is a huge project it is a system centered project dam it was immensely powerful because it was sponsored by the state, it had the support of the state but it ignored various aspects of people is rehabilitation, displacement and so on. People human life and living they were disrupted.

Because of that particular construction in the northeast you will also find the construction of once in a dam okay, when you when we look at these aspect immediately we think that a particular technology here has been designed in such a manner that it displaces the inhabitants

from their habitat, it we are comparing to feel that certain sections of the society they have been marginalized because of the incorporation of such authoritarian technology.

It may be system centered it may be state sponsored, it may be immensely powerful but inherently unstable, it is not only life and living human rights and living but also the amount of natural resources which get disrupted okay, in the form of water, in the form of forest trails all sorts of natural resources. The other I mean the democratic technology which is human centered it may be relatively weak, but resourceful and neural and such argument stands at the heart of Mumford studies of the city architecture and the history of techniques and mirrors concerns voiced earlier in the works of cropping models and other 19th critics of Industry nature okay.

I mean you can look at many other things I mean you can look at Charlie Chaplin's modern time okay, even you can read Hindi letters critique of everyday life okay, this is seminal words, this seminal movie okay they also talked about how particular technology may become very authoritarian in displacing people from its perfume. If you look at the modern times by Charlie Chaplin then you will find how a particular message it reduces the particular range of I mean use of a particular message, it reduces a human being into another message.

A human labor gets alienated from him or she okay, and gets reduced to another form of an effect or miss okay, such is the inhuman considerations when we talk about industry okay, in this thing.

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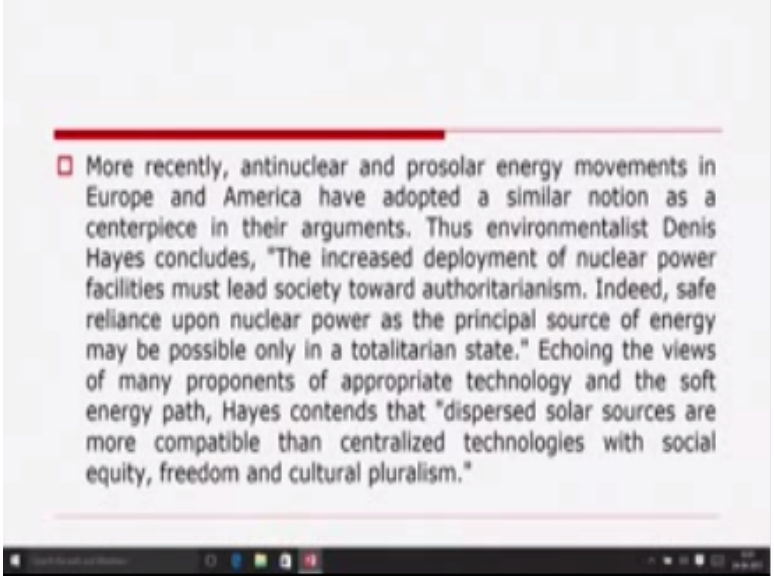

More recently we will find anti-nuclear and pro solar energy movement in Europe and America have adopted a similar notion of sentences in their argument. Thus, environmentalist Dennis Hayes concludes, the increased deployment of nuclear power facilities must lead society towards authoritarianism. Indeed self-reliance of a nuclear power as the principal source of energy may be possible only next totalitarian state, echoing the views of many proponents of appropriate technology in the soft energy pot has contained that dispersed solar sources are more compatible than centralized technologies with social equity freedom and cultural pluralism okay.

In this context what we find is that suppose if I give you an example in the 70s in the 1970's, in the 1990s end again in the 21st century what we have witnessed at least in India, India has gone ahead with nuclear test in Pokhran and especially in Pokhran, it is a scientific question or a political question that has to be settled, even if that is not settled one must raise the debate we must debate the controversies okay.

Even one may say that that is very there is a similarity of opinion between the scientific community as well as the political units of the country on nuclear fission, but the debate does not end even the scientific community is the scientific authority and the political power, powerhouses, political establishment okay, they are not unanimous on this question okay, that is why the debate HST long is it a political question or a scientific question. It is important for researchers to understand the dynamics okay that is why when we talk about the increasing I mean the way has pointed out that the increased deployment of nuclear power facilities must lead

society towards authoritarianism, indeed self reliance upon nuclear power as the principal source of energy may be possible only in a totalitarian state.

It contains that dispersed solar sources are more compatible with than centralized technologies with social equity, freedom and cultural pluralism okay, and an eagerness to interpret technical artifacts in political language is by no means the exclusive property of critics of large-scale high technology systems, a long lineage of boosters have insisted that the biggest and best the Science and Industry bit available where the best guarantees of democracy industry.

The factory system, automobile, telephone, radio, television the space program and of course nuclear power itself has all at one time or another been described as democratizing liberating forces okay. But the way they embody power and authority that has not been captured so well especially among HST scholars you will find that how that means such motion has been challenged okay.

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