Sociology of Science

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Lecture – 07
Ethos of Science: Robert K. Merton- Part II

Dear students, in the previous lecture, I discussed the ethos of science by Robert Merton the person who founded established the branch of sociology called sociology of science; he is a pioneer father figure of sociology of science. In sociology of science, we discuss the social nature of science, the social shaping of science and technology, how culture, norms, values, informal rules, society, economy, political setup, religion has direct or indirect influence on the nature of scientific knowledge production. Robert Merton developed certain ethos of science, certain characteristic ideals of science characteristic spirit of science which he felt is binding upon the practitioners of science.

The scientist within the scientific community they are bound by the ethos of science or the characteristic, spirit of science, the ideals of science the norms of science. They follow certain norms certain, informal rules, they are governed by certain prescriptions things that they are supposed to do when they undertake the research. By certain prescriptions things that they are not supposed to do when they undertake research. If you remember in the last class, I told you one of the ethos of science is universalism as identified by Robert Merton.

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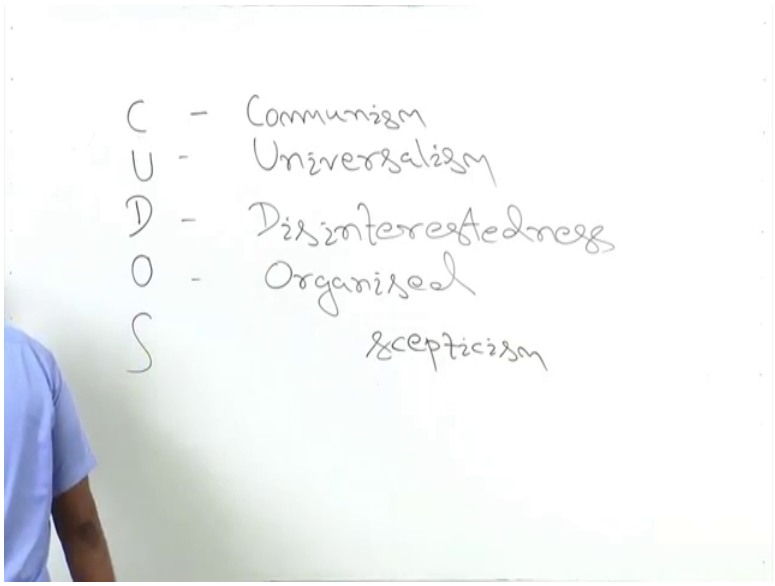

Now, I will just write down the ethos of science for your convenience once again. So, these are the ethos of science universalism, communism, disinterestedness, organized, scepticism. I told you that this can be memorized by us it through this abbreviation C U D O S – CUDOS. This is what Merton says when he discusses one of the ethos of science communism. If you remember, I discussed in the last class, in the last lecture, I told you that communism implies shared nature of science that science is a shared activity. It is a social collaboration of the scientific community of all the scientists involved past, and present, and future.

If you have invented something, if you have discovered something a formula or equation or a law, only thing that you have position of that is it is a commemorative device. It is named after you, ohms law, coulombs law, Newton's law, Bernoulli's equation eponym, it is an eponym where the discoverers name is attached to the discovery that is in a way giving respect to the person who has discovered it. It acts as a commemorative device. You give automatic prestige and respect to the person who has discovered it or it can work as a mnemonic device, a memory device.

Whenever you think of Newton's law, you think of the three laws of motion he has talked about immediately, it springs to your mind that Newton has talked about three laws of motion action regarding action and reaction right as a mnemonic device as a memory device. So, the ethos of science that we are discussing here it can also be remembered

through the abbreviation C U D O S, which acts as a memory device or a mnemonic device.

Now, beginning with the first one I will just repeat what I said in the last lecture that is universalism essentially implies that scientific claim should be taken into account based on its merit, based on its logic, based on sound methodology. We are not going to look at the social background of the person of the scientist, we are not going to look at the nationality whether the person is an African or a American or a Eastern European or a Indian. We are not going to look at the race of the person whether the person is a black or a white or a brown Indian. We are not going to look at the religion of the person a person is a Hindu or a Muslim or a Christian or a Jewish. We are not going to look at the class of the person which class of the society he belongs to upper class, lower class, middle class. We are not going to look at the persons academic credentials whether the person is from Harvard University or the person is from Delhi University, it does not matter.

As long as his or her scientific claim is valid, it should be accepted that is universal feature. It is impersonal feature of science. It is very important, which we take it for granted, but this is how it developed in last one century or so, because Merton was writing developing this ethos during the turbulent period of 1930s and 40s, where once race nationality religion had a bearing on a political ideology, had a bearing on their scientific claims, so that is universalism.

Then communism I told you that it is a communal shared activity. And also the fact that he himself recognizes that the communal character of science conflicts with the intellectual property of scientist as a private property. So, he is aware of that contradiction, but he says essentially it is a shared activity, it should be everything that we come up with as a scientist would be communicated to the scientific community where everybody has free access to that scientific result of finding.

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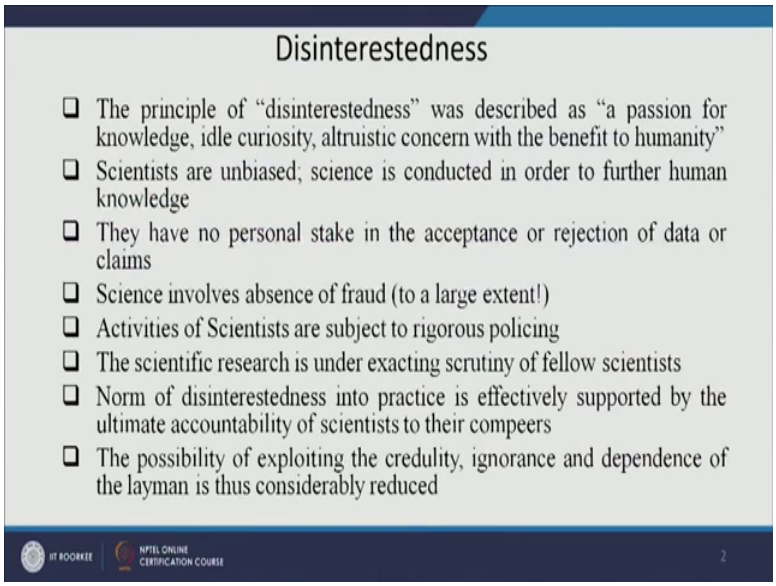

Then we come to the third one – disinterestedness. The principle of disinterestedness was described by Robert Merton as a passion for knowledge, idle curiosity, altruistic concern with the benefit to humanity. What does that mean? A scientist is engaged in scientific activity because of his or her passion for knowledge, because the person has fascinated by this natural or the social universe. The person wants to know more, it is a curiosity. Enthusiasm to understand more about the world he or she lives in it is passion, it is curiosity or it is altruism a desire to bring benefit to the mankind to the human beings to the world we live in through our invention, through our discovery, through our scientific endeavour. This is disinterestedness. Every scientific scientist within the scientific community is guided by the principle of disinterestedness, is guided by passion, curiosity or altruism.

Scientists are generally unbiased. Science is conducted in order to further human knowledge it is unbiased. The scientists do not have any personal stake in the acceptance or rejection of data or claims. There is no personal stake involved. The scientists do not have any personal motives. They do it out of curiosity, out of passion, out of fascination for the natural and the social universe. They are unbiased. Generally, science involves absence of fraud. There is very little forgery, manipulation in scientific world that is how Robert Merton says, but we know that to a large extent it is correct.

But as I told you initially in the previous lecture that scientists are human beings, human beings have their own set of emotions, feelings, preferences, predispositions. Hence that can be a case of manipulation, forgery, fraud, but to neutralize that forgery to that fraud that manipulation within the scientific world, we have the peer system. For one scientist there are state of other scientists who work act as peers who would be scrutinizing, reviewing the work of the scientist in a neutral fashion in an objective fashion, in a non partisan fashion, in a non judgmental fashion. Hence that ensures neutrality of science, objectivity of the science and reduces minimizes scientific forgery to a large extent, because activities of scientists are subject to rigorous policing.

Rigorous policing strict surveillance, who does strict surveillance on the scientist the fellow scientists, the scientific peers. If we work on a topic, on a subject, on a research area, there are other persons other scientist who are also working on the same area same research having the same research interest, they act as our peers. When he claims something it goes to the others other scientists working in the same area for review, for revision, for validation, hence that brings down the forgery manipulation subjective claims to a large extent.

The scientific research is always under exacting scrutiny of the fellow scientists. And this is a norm that we scientists are accountable to our scientific peers. And this ensures disinterestedness as a practical scientific principle. The possibility of exploiting the credulity, the ignorance and the dependence of layman is thus considerably reduced Merton says, because the scientific community subjects each scientist to rigorous policing it ensures that scientific research is neutral objective involves very less minimal forgery or manipulation. Hence, the scientists do not get that opportunity to exploit the credulity, the ignorance of the layman.

So, this is the third principle of ethos of science - disinterestedness that scientists are disinterested, they have passion, they have curiosity, that drives them that drives their research that motivates them to undertake research; at the same time, this disinterestedness is kept sustained through rigorous scientific peer reviewing system which makes science unbiased.

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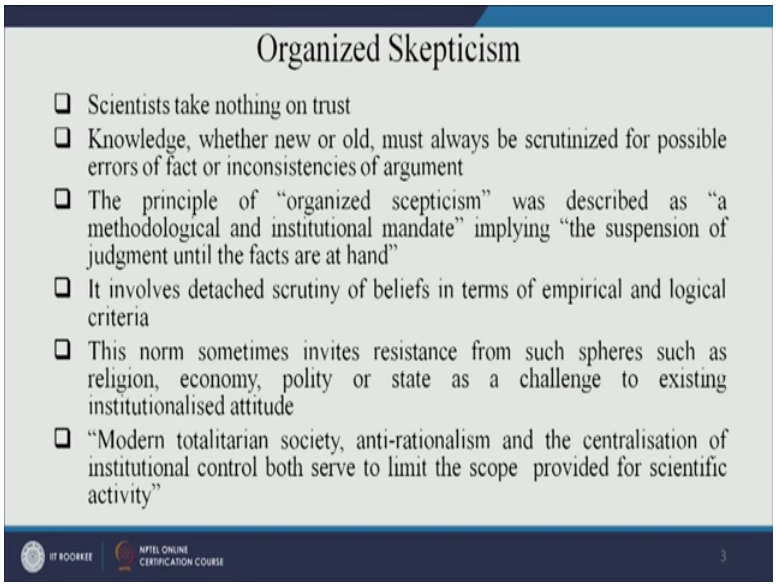

Then we come to the final one organized skepticism. Scientists do not take anything on trust, they take nothing on trust, everything has to be scrutinized for possible errors of fact or inconsistencies of argument. It is a methodological or institutional mandate that organized skepticism is a methodological or institutional mandate implying suspension of judgment until the facts are at hand. You suspend judgment; you do not make a judgement until you have the facts in your hand. See the suspension of judgment, it reminds me of the commercial movies all over the world the Hollywood and the Bollywood movies, where when you enter the theatre you have to suspend disbelief you cannot analyze movies rationally. If you look at commercial movies coming from Hollywood or Bollywood you have it involves watching the movie involves suspension of disbelief there is no rationality, there is no logic in many of the actions right.

But in scientific community you have to suspend, your just mind until your facts we have the facts in your hand. It involves detached scrutiny of facts in terms of rigorous empirical and logical criteria. Now, this organized skepticism, it is a methodological characteristics of scientific world that unless things are tested found ok, found accepted, it cannot be a law, it cannot be a principle. It has to be ratified certified by the scientific community, only then a finding or a result can become a law. But this has always been in conflict with the religion, economy, political system, state is a challenge to existing institutional attitude.

You see we know what Galileo underwent in order to make his scientific claims, he had to fight with the church right. The church had a certain view of the world; Galileo had a scientific view of the world, but Galileo had to fight throughout his life to hold on to his scientific belief. So, such organized skepticism may get attacked from the religion or political system political ideology.

The Soviet Russia for instance, the Soviet - Former Soviet Union during the Stalin era, they discounted they rejected Mendelian genetics saying it is bourgeoisie science; it is not practical. So, they accepted Neo Lamarckism and one of the proponents of that is T D Lai Cinco who held on to Neo Lamarckism and it got support from the soviet dictatorship. Stalin actively sponsored T. D. Lai Cincos thesis of Neo Lamarckism as far as it rejected Mendelian genetics.

What happened the entire world was following accepting Mendelian genetics, but soviet biology was rejecting it because of political ideal. They felt it is Mendoline genetics is bourgeoisie science, it is not practical, it is not for the common man, it is not for the working man soviet agriculture could benefit if we accept. What T. D Lia Cinco is saying based on Evan Maturin's and Lamarck's the original thesis that brought Soviet biology back by 30 years by 1960s it had done irreparable damage to soviet biology such political interference in science can affect the development of science. So, religion political setup economic reasoning or logic can always come in conflict with such organized skepticism. So, these are the four ethos of science I discussed.

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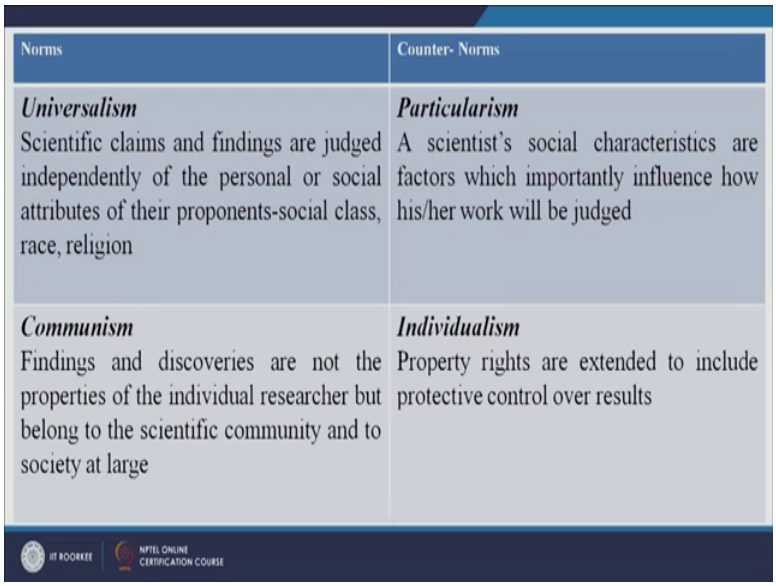

Now I just come to the last part of this lecture where I will discuss the counter norms to the norms developed by Robert Merton. What are the norms universalism, communism, disinterestedness, organized, skepticism.

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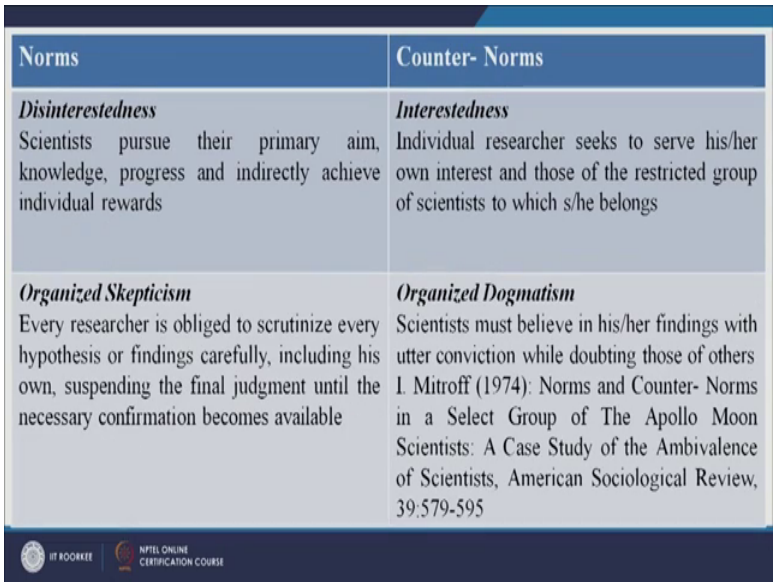

Now, I Mitroff in 1974 published an article in American Sociological Review called norms and counter norms in a select group of Apollo Moon Scientists, A Case Study of the Ambivalence of scientist. So, he studied the Apollo Moon Scientist at NASA and came up with certain counter norms which is prevalent in the scientific community

which comes in direct conflict with the norms identified and developed by Robert Merton. What is the first one universalism that scientific claims findings are judged independently of the personal or social attributes right. We do not look at the person and his or her background that is universalism, when you look at the scientific status or scientific claim.

As a counter norm to that I. Mitroff has developed particularism a scientist social characteristics are factors which importantly influence how his or her, his or her work will be judged. Now, I will discuss this point elaborately when I discuss Matthew effect in science again developed by Robert Merton. Where an eminent scientist gets more credit than a newcomer or not so eminent scientist, when it comes to funding, when it comes to state of art laboratory, when it comes to awards, rewards, when it comes to publication, a well-known established scientist finds it easier to get published in international journals in reputed journals. Whereas a newcomer even if the persons article or writing has merit would not get published easily, but a person of eminence will find it easier to get published. Hence, what does it prove the social background personal attributes of the scientist does matter in the scientific community which can be considered as particularism as a response to universalism.

The second counter norm is individualism in response to communism. Communism science is a shared activity, discoveries and findings are not properties of the individual researcher, but belong to the scientific community. Now, what is individualism we have already discuss that individualism can be here expressed in terms of intellectual property rights of scientists that they hold right to the own discovery to their own invention. They can sell it, use it, hide it from public in whichever way they want that is individualism as a counter norm to communism.

The third one is disinterestedness as one of the ethos of science developed by a Robert Merton. And what is the counter norm counter etho to that is interestedness. Individual researcher looks for personal glory, they look for promotion, they look for prestige, they look for monetary gains hence they undertake research, it is not passion, it is not idle curiosity. It is not fascination with the natural world of the social world, it is desire to improve one's personal status, personal social status, personal glory. You want to be accepted, you want to be known, you want to be a celebrity, you want to make lot of

money through your invention or discovery that is interestedness as a counter norm to disinterestedness.

The next one is organized dogmatism. What does organized skepticism say you have to scrutinize every hypothesis or finding carefully including ones own until the necessary confirmations become available, you do not accept scientific truths as facts or laws as laws or as principles of universal ramification. As a response to that I. Mitroff has developed organized dogmatism, it may implies a scientist must believe in his or her findings with utter conviction while doubting those of others, there have been plenty of cases when a scientist discovery has not been initially accepted, take Mendel for instance, take Watterson for instance.

There is so many scientists initially they it has not got the approval of the scientific community, but they did not stop they had the belief in themselves they carried on the continued. And after sometime they got accepted that is because of organized dogmatism they had strong belief in their own research. Even if it was scrutinize and found it was discredited found unacceptable by the scientific community, but still they continued they carried on, they sustained their research because their strong belief in their own research. A organized dogmatism as that is what organized dogmatism is according to I. Mitroff which he says is a counter normal organized skepticism. So, now, we have four counter norms to the ethos of science developed by Robert Merton.

Here, I end my lecture. In the next lecture, I shall be talking about another topic related to the social needs and the scientific and technology development.

Thank you.