

## **Contemporary Issues in Philosophy of Mind and Cognition**

**Prof. Ranjan K. Panda**

**Prof. Rajakishore Nath**

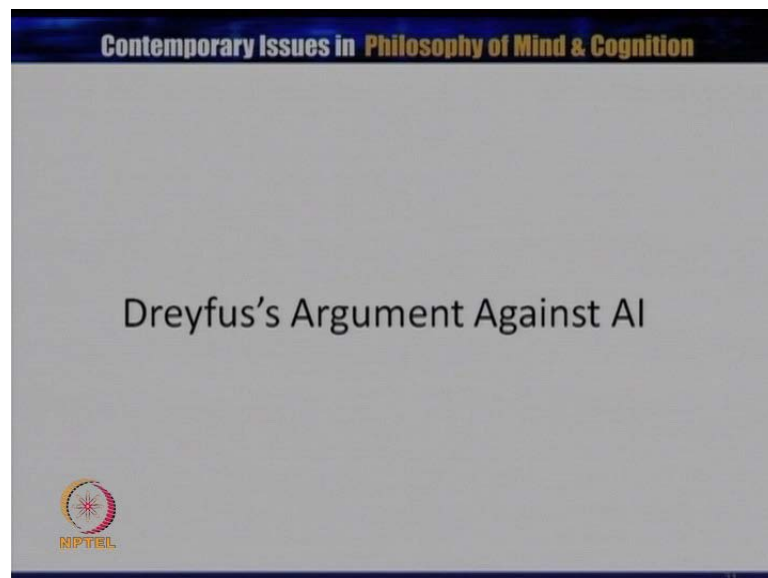
**Department of Humanities And Social Science  
Indian Institute of Technology, Bombay**

**Lecture No. # 23**

**The Limits of Artificial Intelligence -2**

In the last lecture, I was explaining about the limits of artificial intelligence. In this **the** limits of artificial intelligence, I have explained how the computer science fails to explain the concept of mind. Although it explains mind in terms of mechanical way or in the scientific way, the scientific artificial intelligence model of mind is enough to be acceptable to many philosophers and many scientist. John searle has given some kind of arguments against artificial intelligence and then I have given some of the arguments against putnam's view on artificial intelligence.

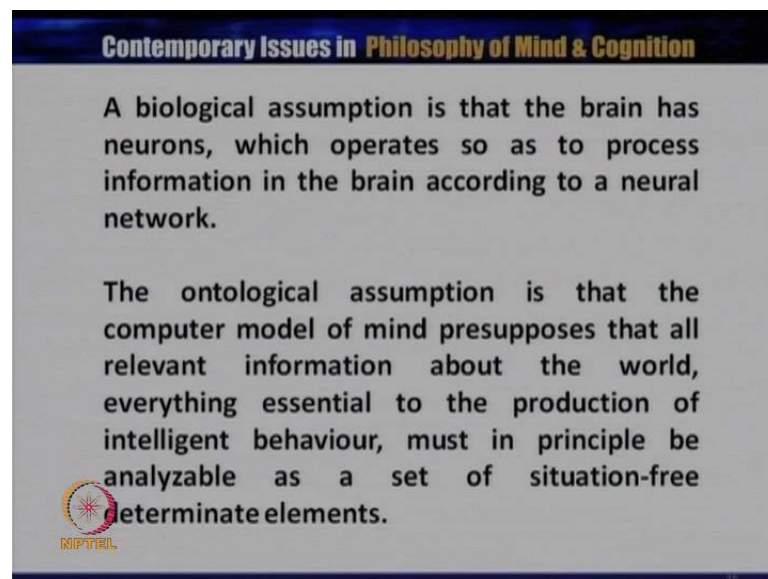
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Now, we are going to explain Dreyfus's argument against A I. As we have seen in the last class, in what computers cannot do, Dreyfus's says that the research in artificial intelligence was based upon mistake in assumptions, which include physiological, epistemological, biological, ontological assumptions about the nature of human

knowledge and understanding. And who will see what these assumptions are? Now, the physiological assumption is that the mind can be viewed as a device operating on bits of the mind according to formal rules. Thus in physiology the computer as a model of the mind, it is conceived of by the cognitive scientist. The epistemological assumption is that all knowledge can be formalized in terms of logical relations, and more exactly in terms of logical relations and more exactly in terms of boolean functions. The logical calculus which governs the way, the bits is related according to rules.

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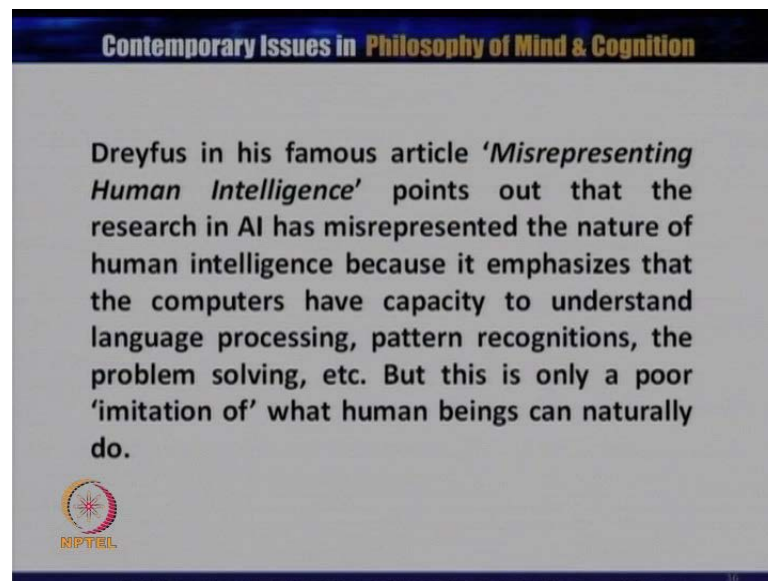


A biological assumption is that the brain as a neurons which operates so as to process information in the brain according to a neural network. But, in the case of ontological assumption is that computer model of the mind presupposes that all relevant information about the world, everything essentially to the production of intelligent behavior, must in principle be analyzable as a set of situation-free determinate elements.

The physiological, epistemological, biological and ontological assumptions have this (( )), they assume that man must be a device which calculate according to rows and data, which takes the form of automatic facts. Dreyfus's argues that all this assumptions can be criticized on philosophical grounds, each of the assumptions lead to conceptual difficulties. He say that a among philosopher of science one finds that an assumption that machine can do everything that people cannot do followed by an attempt to interpret the what, this modes of the philosophy of mind, while among moralist and theologians one

finds a last (( )) to such highly sophisticated behavior as moral choice law of and creativity, discovery claim to be behind the scope of animation. They assume on that machines can do everything that human beings can do, definitely false human capacity exceeds that of all machines. All the above mentioned assumptions are definite because they assume more than they can prove. The idea that the human mind functions like a digital computers is according to Dreyfus's inadequate and misleading.

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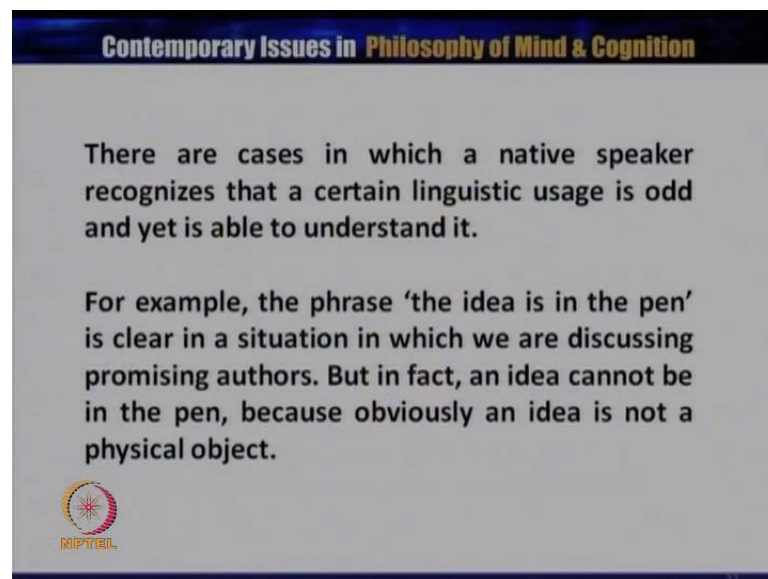
A Drefys in his famous article misrepresenting human intelligence, points out that the research in artificial intelligence has misrepresented the nature of human intelligence, because it emphasizes **is** that computers have capacity to understand language processing, pattern recognitions, the problem solving, etcetera, but this is the only a poor imitation of what human beings can naturally do.

Drefys points out that artificial intelligence field of a research dedicated **to** using digital computers to stimulate intelligent behavior and soon came to be known as artificial intelligence, one should not be misled by the name. No doubt an artificially nervous systems sufficiently like the human one with other features such as sense organs and a body would be intelligent, but the term artificial intelligent does not mean that the workers in artificial intelligence are trying to build an artificial man.

Given the present state of physics, chemistry and neurobiology such as understanding is not feasible, likewise the term intelligence can be misleading, no one expect the resulting

robot to reproduce everything that counts as intelligent behavior of human beings. According to an artificial intelligence scientist **any** complete discussion of behavior should be adequate to serve as a set of instructions, that is it should have the characteristic of a plan that could guide the actions described, but as Dreyfus's argue that what instructions could one give a person about to understand the actions, perhaps some very general rule such as listening to the instructions, look towards an object, make your selections, etcetera.


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There are cases in which a native speaker recognizes that a certain linguistic usage is odd and yet is able to understand it.

For example, the phrase 'the idea is in the pen' is clear in a situation in which we are discussing promising authors. But in fact, an idea cannot be in the pen, because obviously an idea is not a physical object.

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It is not **your** why or how complete descriptions in physiology should take the form of set of instructions. Again artificial intelligence scientist say that human bodies are part of the physical world and objects in the physical world have been shown to obey the laws, which can be expressed in a formalism, manipulable on a digital computer. To be more particular, if the nervous system obey the laws of physics and chemistry, then it is bound to be a part of the physical world. Accepting **that** fundamental assumptions that the nervous system is a part of the physical world that all physical processes can be described in a mathematical formalism, which can in turn be manipulated by a digital computer.

One can arrive at **are** the strong claim that the behavior which results from human information's processing, whether the direct formalisable or not can always be indirectly reproduce on a digital machines. Against the above review Dreyfus's argue that every

form of information processing cannot be principled, be **a** simulated by a digital computer. Therefore, the strong claim that every forms of information processing can be emitted by a digital computer is misleading against the epistemological hypothesis.

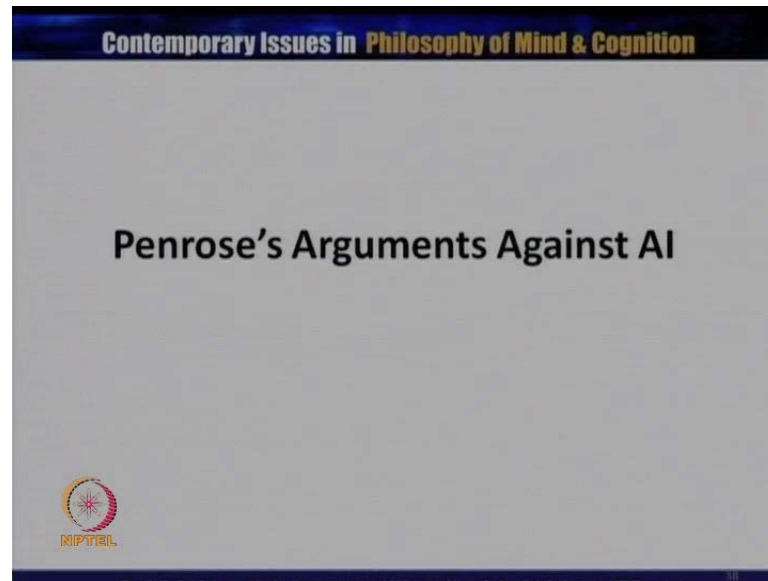
Dreyfus's says that either using to suppose that, that can be a formal theory of what linguistic called pragmatics, there are two reasons to believe that such a generation of synthetic theory of impossible, firstly an argument of principles, for there is to be a formal theory of pragmatics. One **and** would have to have a theory of all human knowledge, but this may while be impossible. Secondly, a description objection, not all linguistic behavior is ruled like. You recognize some linguistic expression as **are as** breaking the rules and yet we are able to understand them.

More clearly there are cases in which **(( ))** recognize that a certain linguistic issues is, are and yet is able to understand it. For example, the phrase, the idea is that **in** the pain is clear in a situation in which we are discussing, promising, authors. Here the ideas in the pain is not refer to a particular physical or a material things, but here we are permitting to a promising authors, but in fact an idea cannot be in the pain, because obviously an idea is not a physical object, it is **a** one of the quality which is existing in consciousness human being.

As we know program behavior is either arbitrary or strictly rule like, therefore in consulting a new usage a machine must either create it as a clear case failing under rules or as arbitrary. **(( ))** feels he or she can recognize the uses as are not calling under the rules and yet can make sense of it, gives it a meaning in context of human life.

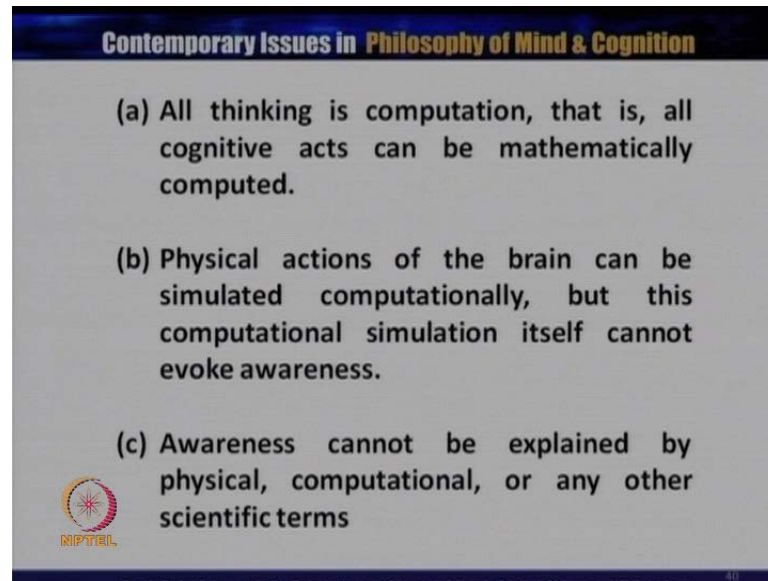
These usages which are arbitrary are likely to be understood in the context of human activities. The Dreyfus's critic therefore is not addressed against computer, for say what against one particular **(( ))** programming them. Dreyfus's **seems** willing to grant that machine intelligency can replace human intelligence; this shows the limits of artificial intelligence as a program.

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Now, we will see Penrose arguments against artificial intelligence. Penrose, one of the most important physicist and as well as a philosopher in his classic books on **what the shadows of the mind** said that very difficult to stimulate the human mind. And while arguing against an artificial intelligence, he says that we assert our own belief, that true intelligence requires consciousness and we are implicitly suggesting that intelligence cannot be properly stimulated by a arithmetic, by a computer, in the sense that we use the terms today. He argues that there must be an essential algorithmic ingredient in the actions of consciousness and assumption is that unconsciousness actions of brain are one that proceeds according to algorithmic rules, whereas the consciousness acts of the minds are now algorithmic. Penrose discusses the nature of consciousness and computations and provide an answer to the questions whether our conscious awareness of happiness, pain, laugh, esthetic sensibility will understanding, etcetera can fit in to a computational model of mind.

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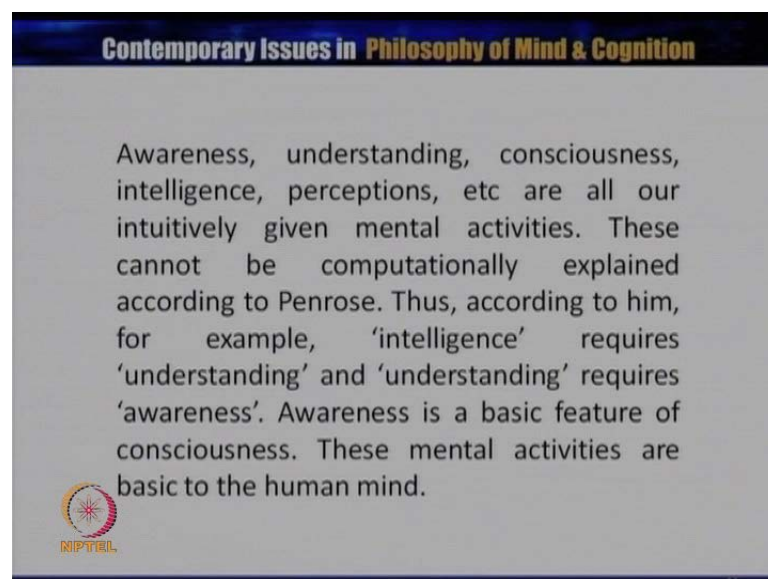
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- (a) All thinking is computation, that is, all cognitive acts can be mathematically computed.
- (b) Physical actions of the brain can be simulated computationally, but this computational simulation itself cannot evoke awareness.
- (c) Awareness cannot be explained by physical, computational, or any other scientific terms

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His argument consisting in the following propositions, all thinking is computation that is all cognitive acts can be mathematically computed, physical actions of the brain can be stimulated computationally, but this computational simulation itself cannot evoke awareness. Thirdly, awareness cannot be explained by physical computational or any other scientific terms, awareness, understanding, consciousness, intelligence, perceptions, etcetera are all our intuitively given mental activities.

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Awareness, understanding, consciousness, intelligence, perceptions, etc are all our intuitively given mental activities. These cannot be computationally explained according to Penrose. Thus, according to him, for example, 'intelligence' requires 'understanding' and 'understanding' requires 'awareness'. Awareness is a basic feature of consciousness. These mental activities are basic to the human mind.

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These cannot be computationally explained according to Penrose, therefore according to him, for example, intelligence requires understanding and understanding requires awareness and awareness is the basic feature of consciousness and these mental activities are basic to the human mind.

Penrose remarks that a person's awareness is to be taken in an effect as a **a** piece of software and his particular manifestations as a material human being is to be taken as the operation of this software by the hardware of the brain and body.

However, human awareness and understanding are not the result of computations undertaken by the brain. Understanding is the inborn activity of the human mind, which cannot be stimulated by a computer. Human understanding cannot be replaced by a computer simulation. The strongly AI most against our ordinary understanding of the mental activities, tries to reduce them to computational functions. According to strong artificial intelligence the differences between the essential functioning of the human brain include all its consciousness manifestations and of a thermostat lies only in this much greater complications, perhaps higher order structure or self-differential properties or some other attributes that one might assign to **and** algorithmically.

In the case of a brain, most importantly all mental qualities thinking, feeling, intelligence, consciousness are to be regarded according to this view, nearly as a aspect of this a complicated functioning, that is to say that they are features nearly of the **(( ))** carry out by the brain. It is therefore obvious that the strong AI cannot explain the mental activities properly, because it misses the very non-computational and non-algorithmic nature of the mental activities. Penrose says that in the human mind there is a non-bearability of thought, did not to make his argument stronger.

He of course from transits **(( ))**, who said it is a serious drawback to me in writing still more in explaining myself that I do not think as easily in words or otherwise it often offers that after being hard at work and having arrived at results that are perfectly clear and satisfactory to myself. When I try to express them in language I feel that I must begin by putting myself of one quiet another intellectual plane. I have to translate my thoughts in to a language that does not run very evenly with them.

I therefore, waste a **(( ))** of time in seeking appropriate words and phrases and I am conscious when requires to speak on a sudden of being often very **(( ))** through near **(( ))**



and not through want of clear, nature of perception. This is one of the small (( )) of my life, once it is accepted that much of conscious thinking can be of a non verbal character as described. It follows that the non verbal thought can never be computational in character.

Therefore, the mathematical activities is very tiny area of conscious activity that is involves in by a small minority of conscious beings for a limited fractions of the conscious life's, there is a vast area of human consciousness which does not follow the mathematical rules of computations.

This non computational consciousness is that which that allows us to become directly aware of something, this direct awareness plays a very important role in our mental life as we have already mentioned. Thus human understanding and consciously awareness cannot be reduce to computational processes, following argument, there is something essential in human understanding that is not possible to stimulate by any computational means. Some philosophers believes that consciousness is a computational property but the fact is that not even scientist, no body know how to design a conscious machines.

(( )) the concept of machine in two ways, in the narrow sense and in the wider sense. The narrow sense to refer those machines which are constructed by a human beings, such as motor cars, type writer, (( )) calculators, office computers and etcetera; in these machines consciousness can depend on. In the wider sense of the world machine there are mechanical devices, which are the artifacts or the intentional products of some kind of intelligence. In this conceptions (( )) put forward the following questions, could a human artifact be conscious, could an artifact of any considerable intelligence be conscious. The first question concerns whether a human beings can produce a conscious artifacts with each superior technological power.

It is like asking whether we Searle ever travel to another galaxy. The second questions resist the issues of whether the concept of an artifact is such as to eliminate the positions of consciousness. Magins does not rule out the possibility that an artifact could be conscious, according to him suppose there were an intelligent, clever, enough to create beings physical just like us and then I think this intelligence would have created conscious beings or consider the doctrine of creation engine. And if had the artifacts of god this is not a reason to suppose our self un conscious, after all that is a sense in which

we are artifacts, for we are the products of natural selections operating upon (( )) in organic materials to generate brains capable of observing consciousness.

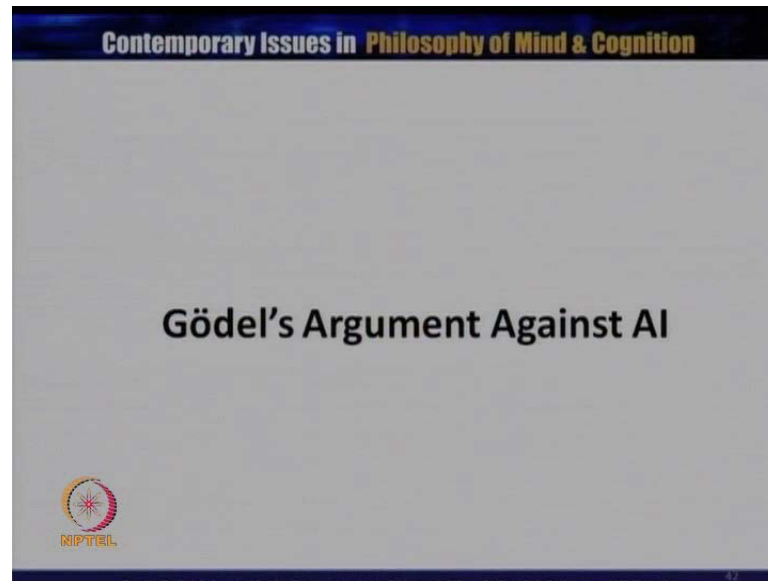
In the wider sense the human beings are artifacts of nature and are conscious, even then all artificial like tables and chairs are not conscious. Consciousness is an intelligent property of organisms and so in the strict only organisms are consciousnesses. That is only living things can be conscious and so conscious being must be animate, organic and alive. As Wittgenstein put it, only of a living human beings and what resembles behaves like a living human beings can one say it has sensation, diseases, a blind ears, is deaf, is conscious or un conscious.

There is a conceptual link between being conscious, being alive. According to this view a conscious being either must be alive or must like what is alive, whether the similarity is between the behavior of the things in questions, in other words only of what behaves like a living things we can say that it is a conscious. Our concept of a conscious state is the concept of a state with a certain sort of behavior expressions.

We cannot really makes sense of conscious stone, because the stone does not behave like conscious beings, the point is that being biological alive is not same as being consciousness, but it is necessarily that a conscious being should behave like a living thing. Instead of identifying consciousness with the metallic composition of the brain, we should identify with certain higher order properties of the brain, which manipulates in conscious behavior. For example, pain is a higher order property of physical states, which consisting having a certain pattern of causes effects and certain out world behavior.

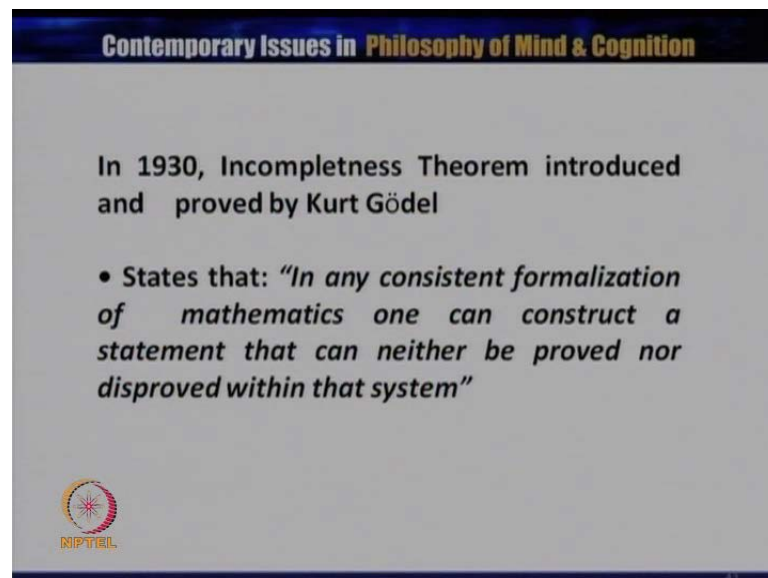
Now, coming back to the problem of artificial intelligence, it goes without saying that notions do not have consciousness, so called artificial intelligence does not entitled consciousness, the computing machines of artificial intelligence are limited in a way the human beings are not. So, that it is out of the question for a conscious mind to arise nearly in virtue of computations. Now, this is all about refuse argument against artificial intelligence and also Penro's argument against artificial intelligence.

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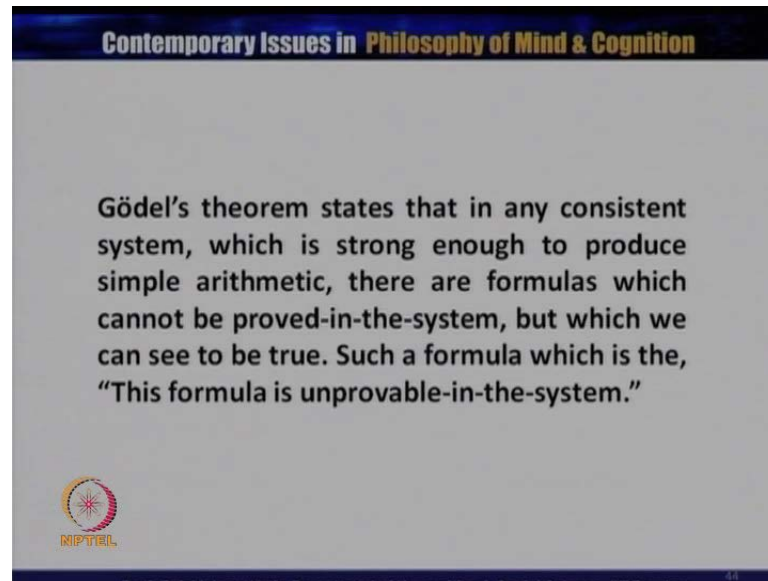
Now, will see some of the argument which has been put forward by Kurt Godel and Godel has given a very interesting argument against artificial intelligence.

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**A** later see what a Godel says against artificial intelligence. Godel's theorem state that in any consistence, which is strong enough to provide simple arithmetic **a** there are a formula which cannot be proved in the system got, which can see to be true, such a formula is the formula which is unprovable in the system. If this were probably in the system, then it will be unprovable in the systems so there will be contradictions.

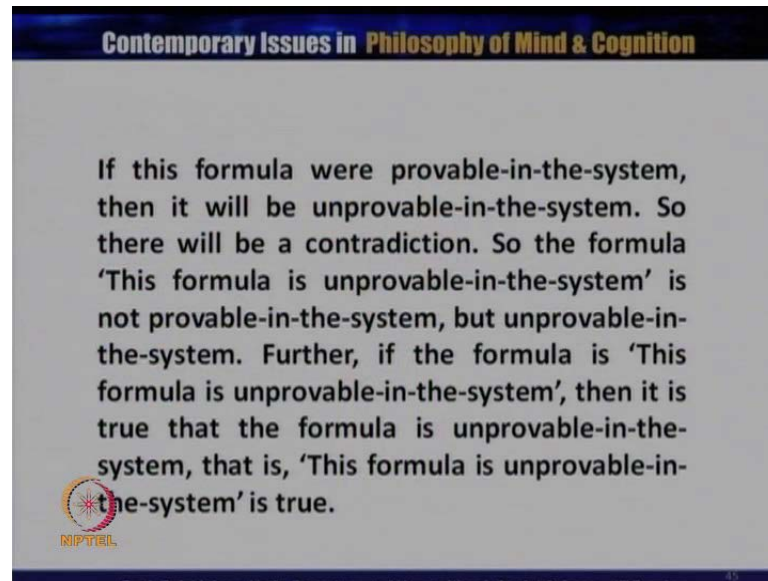
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So, the formula, this formula is improbable in the system is not probable in the system, but unprobable in the system. Further if this formula is improbable in the system then it is true that the formula is unprobable in the system, that is this formula is unprobable in the system is true. The whole effort of Godes theorem is to show that all formal systems which are consistence adequate for simply arithmetic, that is it contain the natural numbers and the operations of the additions and manipulations.

Thirdly, they are incomplete, that is it contain unprovable through perfectly meaning full a formula of which we can see to be true standing outside the systems. Godes theorem must be applicable to (( )) machines, because it is of the essence of being a machine that it should be a complete instantaneous of a formal systems.

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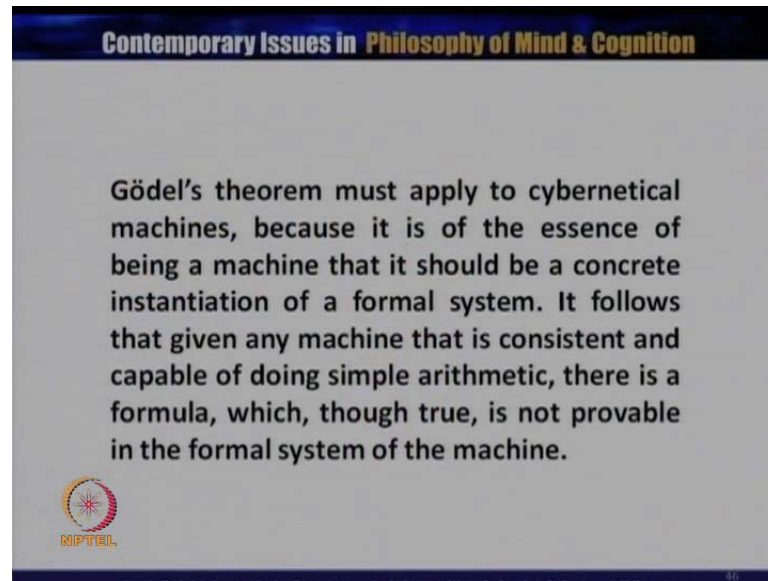


It follows that given a machine that is consistent and capable of doing simply arithmetic, that is a formula of which though true is not probable in the formal system of the machine. Thus it follows that no machines can be a complete or adequate model of the mind, that is the minds are essentially different for machines. As we know symmetrical machines is a device which performs a set of operations according to definite rules.

Normally, we program a machines, that is we can, that is we give, it a set of instruction about its functioning and we need, we feed in the initial information's on which a machines is to perform its calculations. When we consider the mind and the model of symmetrical mechanism we have a mechanical model in view.

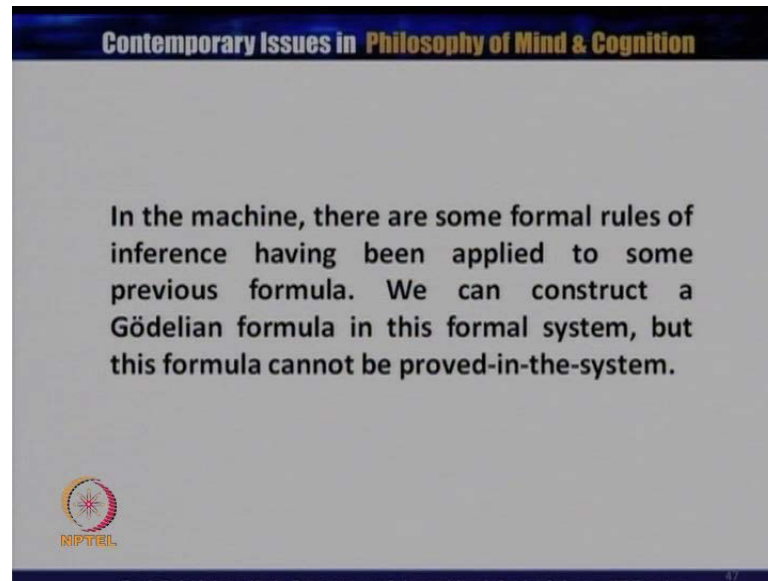
If human mind is such a model, mind is determined by the way it is made, then there is no possibility of its acting on its own as it is governed by certain rules of constructions and certain inputs of information's. But this is not the characteristic of mind, as the mind does not act under readymade rules. In the machines there are some formal rules of inferences having been applying to some previous formula.

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We can construct Godelian formulae in the formal systems, this formula cannot be proved in the systems, thus the machines cannot be proved the corresponding formula as true, but one can see that Godel's formula is true. We can now see that any mechanical model of mind must include a mechanism that can illustrate truth of arithmetic, because this is something which minds can do. In fact it is easy to produce mechanical models which we in many respects produce truth of arithmetic for better than what the human beings can do, but for every machine there is a truth which it cannot be proved, but which can be proved by the mind. Thus in the words of Lucas, this is not to say that we cannot build a machine to simulate any desired piece of mind-like behavior, it is only that we cannot build a machine to simulate every piece of mind-like behavior.

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We build machines capable of reproducing bits of mind like behavior and indeed outdoing of the performance of the human minds, but however machine cannot do much better understanding of truth factors of the any kind of computational work. But in the case of machine that kind of truth is not there according to Godel.

Godel agreements such that the mechanical model of mind, because of its inherent limitations cannot simulate the functions of the human mind, human mind which are infinite and independent. Further it shows that machines are finitely closed and hence cannot compare with the human minds.

The way **godel** godel is **is** explaining, is criticizing that the possibility of any kind of rules, **which** formula which can be proved in the systems, but it is very difficult to find the truth of that, therefore machines are incapable of doing any kind of mental activities. In these two lectures on limitations of artificial intelligence I have explained some of the arguments against artificial intelligence.

Some of the next lectures I will be explaining on how Cartesian mind is non-computational and how the superveneints and emergentism or the thesis of mind establishing one kind of parallelism. And then a some other arguments on the theory of mind, **a** which will not only establishing the distance of concept of mind, which is distance from the body at the same time, some of the arguments are arguing against artificial intelligence; thank you.