

Posthumanism: An Introduction
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Lecture 14
Lec 14 : Posthuman Biology

Hello everyone. This is Pramod Nair of the Department of English, the University of Hyderabad. In preceding sessions, we have looked at posthumanism in its various forms and in its various genealogies including animal studies, cognition studies. We have looked at feminist epistemologies and how disciplines and domains such as disability studies have contributed to posthumanist thought. We are also acknowledged that post-humanism's principal expression, shall we say, or embodiment has been in the realm of popular culture through the representations of cyborgs, of the human-machine hybrids, of human plants and modified human hybrids, chimeras, and such a large variety

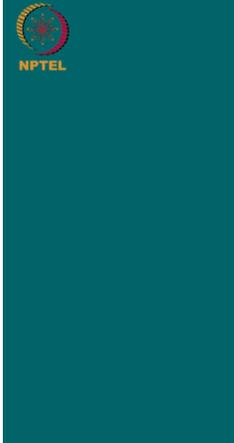
of interspecies identities, interspecies bodies, and interspecies structures. So, this could mean, for instance, the implants in your bodies or your minds of computer chips, the kind of prosthetic devices people have to wear for survival and for normalized, shall we say, functioning of the human body, But we have also mentioned several times the possibilities that exist of enhancing the human form and the possibility, particularly in transhumanism, of transcending the limitations imposed by the fact of repossessing a body. Because humans have a body, those bodies are injurable. Those bodies have limits.

So this could be about, say, intelligence. It could be about, say, immunity to disease or the lack of it. And the fact that we can be broken. beaten or injured. That we will grow old, our bones, our teeth, our senses will begin to erode.

Our chemical processes will be modified over time, and we will require, for instance, supplements, more exercise, or other modes of assistance to keep ourselves going. Which means that the human body is where a considerable amount of post-human thinking has focused. And hence the interest also in, say, the biology of cyborgs and the biology of , as humans, to lesser or greater degrees and in kind, incorporate machines into our lives, into our bodies, into our thinking, and into our very consciousness in some cases. Our session today is on post-human biology.

And let's begin with one of the foundational assumptions of post-humanism. That the body is increasingly interfaced with machines. That human bodies are embedded in a distributed system or network. Our standard Awareness or sense of the post-human comes, as I have mentioned before, from images of Robocop or Terminator and several such films from the 80s onwards, which showed human bodies that are part human, part machine.

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Cybernetic theories and later work by Katherine Hayles and others treated the body as interfaced with machines.

Human bodies are seen as a part of a distributed system or network.

Posthuman Biology

We now have artificial bodies, of course, where the converse has come true. So it's no longer human bodies that interface with machines, but machines and artificial intelligences that take the form of robots, humanoid beings, and artificial beings. So the nature of the form or, to be more accurate, the nature of the human form is a matter of considerable concern to people in posthumanism and to those who despair of posthumanism. So, we have four or five points that are central, and I just mentioned one of them: that the human body is seen as embedded in a network.

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- 1. Bodies are networked with machines *and* other lifeforms
- 2. We are autonomous (because the body tries to act on its own, maintain its equilibrium, etc) and exercise a degree of control over our-selves, but we are also organisms embedded in the environment. Living beings are autonomous, and their biological (physiological, cognitive) possess a capacity to control themselves in order to survive.
- 3. The nervous system is an autonomous dynamic system, where it absorbs information from the environment but processes it through its own internal feedback loops in its neural network. That is, the nervous system works through the arrival of external stimuli (what cognitivists call 'perturbations') and its own internal activities
- 4. Cognition is embodied: it does not occur in abstraction, but in a context which includes the agent's biological body (embodiment) situated in an environment. Cognition is the *adaptive* interaction of the biology of the organism with its environment.



Posthuman Biology

It's not an autonomous system. It's not a self-contained hermetically sealed structure, but it's a body networked with machines through and through. Post-human biology emphasizes that this network could be with machines and other life forms. Which means to say that human bodies are autonomous. because it tries to work on its own and maintain its equilibrium and it seeks to exercise a fair amount of control over our cells over our functions our physiologies and our anatomy but humans are organisms embedded in any kind of environments different kinds of environments so our bodies

our lives are autonomous in the sense of physiological or cognitive or consciousness processes because it possesses a capacity to control itself this is if you recall what we have said when we are talking about cybernetics that the body manages to take in information and regulate itself from the from within even the nervous system is an autonomous dynamic system But it absorbs information from the environment and then it puts itself as in the information through a process within its own internal feedback loops. Which means to say that what we call our nervous system works through the arrival of, through the assimilation of external stimuli and subsequent internal activities. So it's a two-fold, two-step process. Information comes in and this information is subject to processing by our internal networks, our internal mechanisms.

And you cannot separate the two. So it's not enough to say, oh, we are autonomous. We are autonomous after processing. being part of a network after being embedded in a network and through which we have a feedback loop. So, yes, the consciousness is mine.

I mean, my consciousness is not just taken from here and there. It is taken from here and there and then processed internally. And that is the feedback mechanism where the body takes an external stimulus, puts it through its own internal processes, and then generates what we understand as consciousness. So, this is important to understand: cognition or

consciousness, as we discussed in the last session, is not something that happens in abstraction.

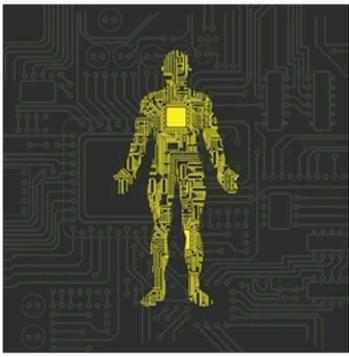
It occurs because we are embodied beings in a context that involves this embodiment. Remember what we said: that consciousness is both embedded and embodied. That consciousness emerges from our body's interactions with the world and the processing of that information within our internal structures, our neural network, our central and peripheral nervous system, our brains, whatever you want to think of, if you want to break it up. And the crucial point is: consciousness is embodied. So, in post-human biology, this becomes a major step,

that we have to think of our biological processes, including our consciousness and our cognitive processes, as both embodied and embedded. Embodied because we have a flesh-and-blood body; it has its own neural network, muscles, and various other components. Out of those interactions the body's interactions with the world and our body's internal processes also work as a kind of network inside us, that's how consciousness emerges. So, the larger point is that what we think of as subjectivity, our sense of ourselves, our awareness of ourselves is increasingly a techno-subjectivity. For post-human biology or post-humanist views of biology, since the body is networked or interfaced, if you prefer with machines and systems, including data of various kinds or electronic information-gathering systems, our subjectivity is techno-subjectivity.

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- Human subjectivity is techno-subjectivity because the body is embedded in, interfaced with, machines and systems, including data and electronic systems.
- The human is a part of a system with which it shares borders and functions, and from which it draws stimuli, nourishment and data.
- Multiple forms of life constitute the human, and evolutionary traits from the future may well be present today itself (Campbell and Saren)
- Human biology has co-evolved with other biologies (life forms) and is likely to do so in the future too.
- This implies a 'species cosmopolitanism', where evolution involves the blurring of species identity and borders



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It's not subjectivity in isolation. It's not subjectivity as a human plus a machine. It's human with a machine. We are plugged in. The machine is plugged into us.

We are plugged into the machine. So human subjectivity is inevitably a techno-subjectivity. Because the body is embedded in and interfaced with machines and systems. Of all kinds, like I said, could be data systems. It could be, for example, the biometric system to which our data, health data, is recorded, distributed to, say, health service providers, insurance providers, or the local pharmacy.

It could be electronic surveillance, which is, of course, now a part of our lives. It could be all the databases into which our bodies are constantly being fed as mathematical data. So, our sense of who we are, our subjectivity, is actually techno-subjectivity. And you can no longer think of subjectivity as just a sense of ourselves coming from who we are as bodies, as brains, as minds, and whatnot. It's a huge step.

It's a perhaps disconcerting and unsettling step. But this is an important development. Then, having said that we are both embodied and embedded, we recognize in post-humanist views of biology that the human is part of a larger system. And humans share borders, functions, and forms with these other systems. Remember, stimuli or information comes in from the outside.

The brain processes it. And consciousness emerges. So, humans interface with the world and share borders with it, which means there is no such thing as a self-contained human body. So, let's move now from questions of machines and technology to something else. We do know, and we have mentioned this before, and it's now more or less commonplace knowledge, that we survive

because various other life forms help the human body to survive. We know that we have certain kinds of bacteria in our stomachs that help us digest our food. That these life forms are crucial to our functions, and hence people who have a shortfall in bacterial presence have to take probiotics and things like that, right? So, are you an independent life form?

Are you just what your body is? No. Your body is made up of several other life forms. Let me complicate this a little more. What we think of as my DNA or your DNA is not yours or mine.

Our genetic material, our genetic data, comes from a complete family genealogy. Right? The DNA comes down to us from our ancestors. So tell me, how is my DNA exclusively mine? It's not.

It's not because my DNA comes to me from my ancestry. It's based on community, it's based on location, it's based on ethnicity. DNA profiles are actually collective profiles in which you are one speck. You are one dot. And this is important because we recognize then that what we are as humans is actually one step in an evolutionary process.

For example, as evolutionary biology will tell you, how did our present posture as erect human beings emerge? How did Homo sapiens emerge? We moved up gradually on an evolutionary scale and have reached this level. This means that our biological form and function have both emerged over millennia of human evolution. Now tell me, do you think your biology is exclusively yours?

No. Because it has come down to us from ancestors of different generations, from people who lived across millennia, long dead and gone. Our general human interest in ancestry stems from this. Our question to ourselves is, who are we? Where do we come from?

Paleontologists, paleobotanists, and people working with deep time and deep histories are very interested in ancestry because we now recognize that our biological structures whether it's how the human eye evolved, how our brains evolved, or how our posture evolved all of these have evolved over millennia, from the first humans to the present. So think about it. Our biology is not our own.

Our DNA is also not our own. And what you think is unique to us our eyesight, the way our eyes have become, the way our olfactory or auditory systems have developed. These are not accidents. These have occurred over a long period of time. Some people might think of it as accidental Darwinism, and neo-Darwinism goes hammer and tongs at these ideas.

But for now, we will not get into that particular debate. What's important to recognize is that biological features, cognitive features, and physiological features are traits that have come to us over millennia. They could have also come from mixtures of genetic material. They have. There is no such thing as a pure human race.

All races have been mixed and merged, and so on. Now, the question therefore is, since our biology takes a simple example, our biology's core evolution, the mitochondria in our cells, as biologists now tell us They were originally bacteria. As evolution proceeded, these bacteria were absorbed into the cell. They became what are called the powerhouses of the cell, as biology lessons will tell you.

And it became a part of the human cellular structure. They were originally bacteria. Now think about this. If you look at your biology lessons, the prokaryote, eukaryote, and things like that, We will discover how we moved from single celled organisms to multicellular organisms to where we are now.

In the process, some of this material came from here and there. We absorbed material. We grew with it. Now do we know how we will evolve in the future? Do we know whether this bodily structure which has co-evolved with other life forms including bacteria will remain the same?

How will it evolve? Elsa and I proposed that we need to accept something called species cosmopolitanism. That we will co-evolve with other creatures as we have always evolved. Humanity has absorbed material from all sorts of things. We continue to live on earth thanks to the bacteria in our stomachs, thanks to the plants outside, thanks to the various animal and bird species that constitute our environments.

As we know, we require plants, we require the soil, we require the earthworms and other creatures of the soil because they keep the planet in a working condition, and humans require that working condition in order to survive, in order to live. So, we've got to avoid it. We are a species that exhibits what I refer to as species cosmopolitanism. Now, We know that the first human view privileges informational patterns and that everything about our bodies consists of information, and whatever we think of as the body,

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(1) The posthuman view privileges informational pattern over material instantiation, so that embodiment in a biological substrate is seen as an accident of history rather than an inevitability of life.

(2) It considers consciousness, regarded as the seat of human identity in the Western tradition long before Descartes thought he was a mind thinking, as an epiphenomenon, an evolutionary upstart that tries to claim it is the whole show when in actuality it is only a minor sideshow.

(3) It thinks of the body as the original prosthesis we all learn to manipulate, so that extending or replacing the body with other prostheses becomes a continuation of a process that began before we were born.

(4) Most importantly, by these and other means the posthuman view configures human being so that it can be seamlessly articulated with intelligent machines. In this view there are no essential differences between bodily existence and computer simulation, cybernetic mechanism and biological organism, robot teleology and human goals’.

Katherine Hayles

Posthuman Biology

The body is something that is a conglomerate of information networks, and we need to see it as seamlessly articulated with other organisms, with other creatures. So, as the post-humanist critic Francesca Ferrando asks, what is human if there is no human without bacteria, viruses, and so on? What is human if there's no human without bacteria, viruses, and so on? Humans, as I just said a couple of minutes ago, share an ancestral kinship with several forms of life. We are not original.

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- Humans share an ancestral kinship with several forms of life.
- Human DNA, itself the product of evolution and change, is not simply a set of data: it requires a subject to enact that data, to implement it, in a particular setting.
- Our biology is the congeries of the human and the nonhuman (including the microbes).
- Even the human genome is a hologenome: the sum of the genetic information of the host and its symbiotic microorganisms (Rosenberg and Zilber-Rosenberg)

‘What is “human”, if there is no ‘human’ without bacteria, viruses and so on?
Francesca Ferrando

*Humans are holobionts
(an assemblage of species living together).*

Posthuman Biology

We are not solitary. We are not unitary. We are not monocultural. We are hetero cultural. Human DNA itself has evolved over millennia.

Right? And the DNA is not just a set of data; it's not just a code. The code requires a body in which it will appear. Remember, I used the term 'manifest' in the previous sessions.

It requires a body in which the genetic features, the genetic data, can appear in a certain form. Our biology, therefore, is what biologists refer to as a congeries of the human and the non-human. including, but not limited to, the microbes and the viruses. So, what we call the human is a mixture of the human and the non-human. Please, let's get this right.

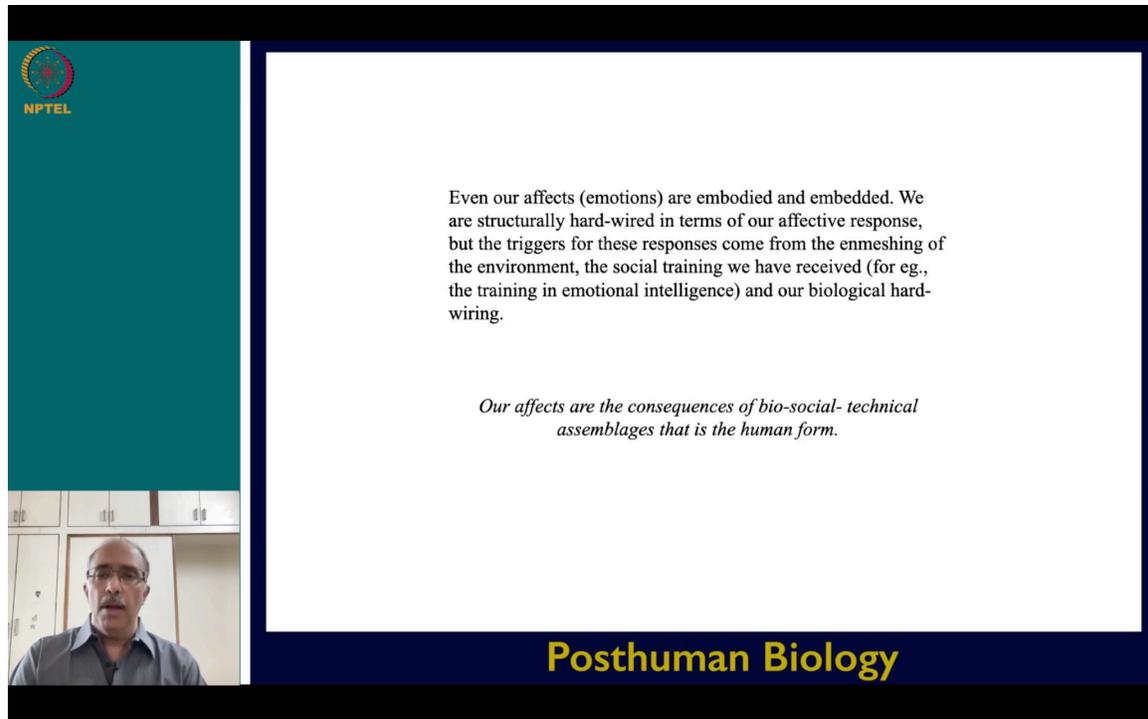
What we think of as the living organism called the human is actually a mixture of the human and the non-human. It is also a mixture of the living and the non-living. Because, after all, the chemicals that constitute our body are not alive. The chemicals, including the things that make up your bones calcium, your teeth, right? These are chemicals, which is to say that our animated life, our animation, hinges upon the inanimate.

If you want Irony in biology here it is. What we think of as the anima of our lives, the vital force of our lives, changes on chemicals which are non-living. So the living, the biological, both depend on the non-human and the non-living. It is the sum total of this.

Even other emotions come from that. As we know, our emotions come from, of course, our hardwiring the neurological structure of the human brain. But the triggers for these responses come from elsewhere. Remember what we said about consciousness and cognition. Our sentimental responses come from the environment, but they also come

from our biological hardwiring and the social training we receive, which is what we refer to as emotional intelligence.

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Even our affects (emotions) are embodied and embedded. We are structurally hard-wired in terms of our affective response, but the triggers for these responses come from the enmeshing of the environment, the social training we have received (for eg., the training in emotional intelligence) and our biological hard-wiring.

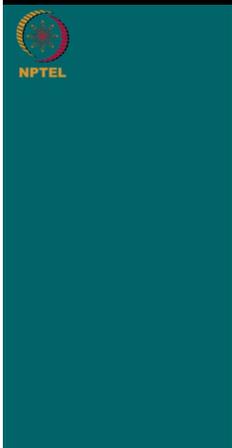
Our affects are the consequences of bio-social- technical assemblages that is the human form.

Posthuman Biology

So we learn, for example, to put on a certain kind of expression when attending, say, a marriage or death ceremony, an appropriate expression. How do we know? How do we learn to do this? We learn to do this because social training enables us to develop what is called emotional intelligence. It's not automatic.

Yes, it depends upon the way we are hardwired. Yes. But that is not the only explanation. Increasingly we see that, and we have seen biologists, neurologists as well as philosophers arguing for the plasticity of the brain, that the brain can absorb changes to itself, find bypasses, that what is within us as a brain can respond to stimuli, modify itself. People like Catherine Malibu and several others have talked about it, philosophically speaking.

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Neuroplasticity: The brain is plastic, in the sense it can initiate structural and functional changes to itself in response to external or internal stimuli.

But plasticity can also be destructive, and the brain can produce an entirely different person as a result of, say Alzheimer's or brain lesions, a 'destructive plasticity' (Malabou)



The "self" includes body and brain (or mind), indeed includes a myriad of "synapses," such that self-reflection increasingly means the expanding awareness of ourselves as just such a multiplicity of synapses, of *interconnections*. These interconnections are within us but they are also interpersonal and socio-political.

--Hugh Silverman

Posthuman Biology

And, of course, the point I mentioned last time about mirror neurons, the work of Christian Kaiser and others, that our brains fire mirror neurons upon seeing somebody else do certain things, and that's how we develop both mimicking and the ability to learn by observation. Right? So, empathy, sentiment, learning are all indications of our brain modifying itself to the arrival of stimulus from outside. So post-human biology clearly is a far more complicated thing than we have given it credit for because on the one hand we say there is genetic material but on the other we say we are also social creatures.

We cannot say that Our personalities, who we are, depend only on one or the other. It depends on both. So, for post-humanists, biology, as in human biology, is a very complicated, very layered subject of analysis. That who we are, as in human subjectivity, is actually a mishmash, a congeries of our biological structure, by which I mean the DNA, the flesh and bone stream, our neural processes.

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There are also larger environments which include things like the diet we consume, the stimuli from the outside, and of course the training we receive in terms of education. So post-union biology or post-union approaches to biology is a very complicated domain, but it's also one of the most fascinating because that's where major challenges of the philosophical and ethical variety have come up, particularly concerning questions of enhancing the human body and the moral enhancement of humans. Thank you.