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Question 4; explore some of the issues surrounding the attribution of consciousness to machines and non-human animals.

I think the question can be alternatively written as 'Can machines and non-human animals have consciousness, and if they could how could this be so and what problems might this bring for us humans'?

And what is consciousness? According to the Collins English Dictionary it is to be; alert and awake, aware of one's surroundings and of oneself, aware of choices of action. It is a part of the mind that is aware of a persons self, surroundings and thoughts.

What is a machine? The same Collins dictionary describes a machine as -

- 1 an assembly of components arranged so as to perform a particular task and usually powered by electricity
- 2 a vehicle such as a car or aircraft
- 3 a system within an organisation that controls activities and policies: *the party machine*
- 4 to shape, cut or make something using a machine.

For the purpose of this essay it is a reasonable and justifiable position to assume that the type of machine intended to be the subject of an essay is the type described in definitions 1 and 2.

It may be expedient at this point to be reasonable and to posit that machines cannot have consciousness but that an animal can. An animal is any living being that is capable of voluntary movement and possesses specialised sense organs, but is not a human being. It could be argued that all animals must have consciousness to enable them to interact with their environment using these special sense organs, otherwise they could not have survived as a species. A machine does not have the faculty of voluntary movement and has no sense organs (although it may have laser beams and other sensors to enable it to carry out its functions as programmed by a human). This could be a reasonable position given the current level of technology. But in 'other worlds' things could be much different.

'The Bicentennial Man' shown in 1999 is a film starring Robin Williams who acts the role of a model NDR robot purchased by the Martins family to be a domestic slave. The robot becomes sentient and petitions the state to be granted human status so that he can marry. These petitions are refused. The robot then finds a way of injecting human blood into his body so that he becomes more human and he starts to age, just like humans. He is then at last granted the status he covets on his deathbed and he marries his sweetheart, then dies, his new wife following

him in death a few minutes later after requesting that her life support machine be turned off, and this is done (by another robot).

This story is just science fiction at the moment but could this become reality? Could machines be developed that can have a consciousness. Consciousness may not necessarily be allied to a conscience in machines, and androids of the future and this is the stuff of another series of science fiction movies like 'The Terminator' and 'Judgement Day'. Could such a nightmare scenario really happen?

## Animals

A more thorough and technical description of an animal may be necessary to consider the issues concerning their consciousness and what separates them from human beings and plants. Animals grow without having to synthesise energy from the sun like plants and get their energy from a more complex food material like proteins. Animals can have a vertebrate skeleton with a spine e.g. birds, reptiles, fish. They all have a distinct head enclosing a brain. Insects are invertebrates but are still animal as they have a head and thorax, an abdomen and a skeleton. Worms are hermaphrodite - they have no skeleton and are not animal. A human is considered a higher order species and non-animal.

Humans and animals rely on survival by getting the necessary energy from complex foods whereas a machine must get its power from an external energy source (electric or thermal).

Humans and animals are driven by conatus, the urge and desire to reproduce themselves. Both are capable of spontaneous action and these actions normally elicit to satisfy desires, needs and actions to survive. Machines then cannot have conatus, a requirement of all animals.

Where does our consciousness reside? Just in the brain, or in bits all over the body, like the heart as often pronounced in the familiar sentences - 'follow your heart' and 'go with your gut feelings'. If consciousness resides in our body, in our soul perhaps, where is this stored and how. According to Aristotle the soul is that which gives life to the human being. All thinking is conscious according Descartes, so a machine would have to think for itself and to do what? There is at present no widely accepted theory of why consciousness evolved.

## Machines

A machine cannot do anything independently (yet)! A simple drill is a machine designed to carry out the action of boring holes as programmed by the user. They need a higher order being, a human, to build them, programme them, maintain them and provide energy. Machines can have a store of energy via a battery or fuel cell but these need to be built, replaced, charged etc. A machine

has no conatus, and no survival instinct, and therefore it cannot have consciousness and no conscience. It does not know that what it does is right, wrong or immoral. Machines have memories, but these can be completely erased and replaced, they are just binary memories to enable programmes to be prioritised and executed. Humans, normally, do not lose all their memory. Dementia sufferers can remember, although it will be a diminished memory and switch between long and short term memory episodes and recall may be erratic. A machine cannot die as it has not lived, as to live means ageing and becoming frail with diminishing senses, as the NDR robot found out. Only by taking on human physical characteristics could it die. Humans though can have false memories, and false memories can be implanted. Like all our faculties our memories are fallible even though we may have no apparent disorders of the mind. This is how the wrong people are sent to jail, and why witness statements are rarely totally accurate. Machines could be regarded as having an infallible memory, and a memory that can be copied. If my computer memory were to be faulty it would soon be unusable as it would 'forget' to execute programmes, or do so but in the wrong order and would soon crash. If the computer memory were to be damaged the parts storing the memory could be replaced and the programmes and data reloaded. Human memories cannot be repaired or replaced. Memory in computers and machines are just binary zeros and ones. It is not like human memory that can respond to sight, smell and touch. Recall of human memory can also be triggered by smells, touch and sight, mostly at random. These are memories 'with feeling' that would be absent in a machine where memory recall is as programmed, and does not go astray unless there is a fault.

In the Terminator movies machines became sentient and then evolved into a more efficient 'species', just like human evolution. What would the trigger be for this, and why would machines become sentient, with all the human problems that would bring? They would have to compete for limited resources with other machines and humans. They would have to develop a survival instinct. While writing this I am reminded of 'The Borg' from the Star Trek stories. These are creatures that are part human, part machine and have formed one massive unified collective in order to conquer and rule the universe.

## Summary

Currently it would be justifiable to posit that machines cannot have consciousness but animals do, and must have for species survival (although not all survive).

Could animals and humans be considered part android where there are machines like heart valves and pacemakers fitted to humans (and may be even animals e.g. the family dog)?

The standard nightmare scenario of machines becoming sentient and conflicting

with humans in the battle for dominance and resources is a common theme of science fiction but perhaps the story writers have got it the wrong way round. What if humans evolve into machines in a misguided effort to prolong and enhance life. Heart pacemakers and prosthetic limbs are common enough, and other devices will probably be invented to replace other organs like kidneys and lungs and sensory organs - we already have machines that carry out the function of kidneys via renal dialysis. Would this future android be fully conscious, and have a conscience? These other worlds of machines dominating humans may yet be the world we end up with.