

Life and Robots, Humans and Robots: Some Suggestions on Robotics from the Viewpoint of 20th Century French Philosophy

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The following is a report by a philosopher with no particular knowledge on robotics or robot sociology. While it is true that robots may independently constitute a subject of discussion, the development of life sciences is posing a wholly different kind of problem for robotics. Namely, how would it be possible to distinguish between life and machines in the ordinary sense of the word? Moreover, is it possible to sustain the division between the natural and the artificial, between the technological and the human? This is becoming an important theme for philosophy. In this report, I shall examine the philosophical concepts of life and artificiality surrounding the concept of machine, by taking up contemporary philosophy as the subject matter. I would then like to give a few suggestions for robotics.

To begin with, I shall take up the philosophy of Deleuze and Guattari. For Deleuze and Guattari, the psychic apparatus and the concept of a living nature upon which it is based is regarded in the same light as the concept of machine (the desiring-machines). What is accentuated in this context is the machine's meaninglessness, inherent in its materiality. I am rather uneasy as to whether Deleuze and Guattari's conception of machines fits in with contemporary robotics, where robots have transcended being imaged merely as a metallic substance, and have acquired the capability of becoming information itself, such as in the form of computer viruses. In other words, robotics is facing a situation in which materiality itself is becoming diluted. Particularly in *Anti-Oedipus*, Deleuze and Guattari's conception of machines is based on a materialist psychoanalysis, as it attempts to explain mental unconsciousness through machines. Meanwhile in *A Thousand Plateaus*, they place huge emphasis on technologies that deal with metal, such as the making of metal handicrafts (metallurgists). In this illustration, they lucidly present the idea that minor sciences are 'machines' that slip through the hierarchy of the state (the War Machine). All the same, what was important for Deleuze and Guattari was nothing but the machine's materiality. Reduced to this stage, materiality overlaps the self-generating order of nature itself.

Bearing these perspectives in mind, how would it be possible to illustrate the identities and differences between organism and machine, between machine and human? In this study, I would like to examine Deleuze and Guattari's proposition that machines function by going insane. Normally, although technical machines 'wear down' even in their everyday use, they do not 'break down'. However, the kind of machines

accentuated by Deleuze and Guattari in their materialist psychoanalysis, in virtue of being connected with the Body without Organs, ‘continually break down as they run, and in fact run when they are not functioning properly’ (AO39). This highlights the fact that machines embody meaninglessness as a material suspension or cut off.

<The Frame Problem: The Limits of Inquiry Concerning Cognition>

Before examining the claim that ‘machines function by going insane’ (or in other words, that robots are *supposed* to go insane), I would like to give a few words on the frame problem, a topic which has routinely been taken up in discussions dealing with robotics and philosophy. The frame problem involves the cognitive functions normally displayed by organisms and humans on the one hand, and the perceptual and motor functions of robots on the other. However, what I want to show is that the very framework upon which this problem is founded should be regarded as dubious.

When one gives instructions for the operation of (i.e., programs) a robot, one must presuppose action in the *infinite* expanse of the world under *finite* calculations. Insofar as this is so, there is a limit to the robot’s cognition. Taking the robot for a walk on the street, making the robot board a train – these are both prime examples of a situation in which this problem arises. Whereas there is a limit to the factors to which the robot can make a decision, in reality there are always unexpected and unforeseen situations – situations which, if one attempts to enumerate, are virtually infinite. If the object of cognition is another robot, the problem becomes even more complex (imagine two robots trying to make a feint or deceive each other by predicting each other’s actions). In contrast, humans and organisms are capable of slipping through unexpected situations with a moderate degree of ‘ambiguity’; this ability is built into their cognitive function. In fact, organisms will usually employ one action or another in the face of such unexpected situations. In this sense, they possess a sort of ‘robustness’, which goes hand in hand with their ‘ambiguity’. If an obstacle arises in the middle of the street, an organism would likely proceed by avoiding the designated route. If an accident occurs while trying to board the train, an organism would likely give up or resort to some other measure. These are both instances of the coexistence of ‘robustness’ and ‘ambiguity’.

Needless to say, what organisms and humans are doing when they engage in action is something that presupposes a sort of frame, or rather a complex of meaning. Borrowing a term from the ecological psychologist Uexküll, we could say that this frame (or complex of meaning) is the *Umwelt*. This term, which is also employed by Heidegger and Deleuze, is extremely important in understanding the actions of organisms and humans. What this word shows is the fact that, when an organism engages in action,

the organic meaning which this action possesses forms to a certain degree a framework, and that the formation of this framework takes place within the entire past history of the organism's individual body and its species.

Nevertheless, there may be various views as to whether or not the Umwelt is exactly a frame. If life can only be lived within the Umwelt, it would be impossible to cope appropriately with any realm that slips through the Umwelt (for example a context that is not encompassed within the Umwelt's chain of meaning). In such a situation the 'ambiguity' necessary for life would be caged up within the Umwelt. However, conditions are rather different in the case of humans. While being a bodily existence undoubtedly presupposes being confined within the Umwelt, humans are able to ambiguously overcome this boundary. Humans are in this sense extremely flexible. This ability may be interpreted as the power to gradually 'open' the Umwelt. Conversely, a human who persistently adheres to the structure designated by the Umwelt and is unable to go outside its framework would certainly appear to be pathological (this is just what the Heideggerian and Bergsonian psychopathologists have often claimed).

We should take notice of the fact that both Heidegger and Deleuze conceive of the human's Umwelt as having a fixed limit. That is to say, while regarding the Umwelt as the *criteria* for human life, they both regard the human ability to 'open' this Umwelt and advance to a different realm as the *essence* of human life. In this context the *Welt* comes into question.

The Welt is the ideal world that exists beyond the individual worlds of meaning imposed upon each life form, i.e. the Umwelt. In this sense, the Welt is a meta-structure as opposed to the Umwelt, a realm that makes possible the unification of the various meanings which the individual life forms discern.

For Heidegger, the demarcation between the Welt and Umwelt is both clear and ambiguous. This displays the ambiguity of the Umwelt itself.

Heidegger uses the term *Weltarm* to describe the fact that animal life can live only within the Umwelt. This term is an expression meaning 'the world is poor' (cf. *The Fundamental Concepts of Metaphysics: World, Finitude, Solitude*). Yet it is this state of being 'poor' in which the possibility of being open towards the world is embodied (this point closely resembles Agamben's argument. See *The Open: Man and Animal*). While animal life cannot completely break loose from its Umwelt, it is able to gradually modify its own Umwelt. This is achieved through environmental adaptation and an impulse towards evolution. This is a consequence of the fact that the life-form's field of vision is open towards the meta-structural Welt.

Deleuze too discusses the difference between the Welt and Umwelt in *The Logic of*

Sense, in the context where he deals with static logical genesis. For Deleuze, the *Umwelt* involves a particular world of meaning, a unique possible world. In contrast, the *Welt* is described as something that realizes a 'trans-world identity' between the various possible worlds. Although he employs Leibnizian concepts, Deleuze's argument in this section is extremely Heideggerian. This is because it is nothing but the genesis of language that establishes and guarantees this trans-world identity. By employing the method of hermeneutical ontology, Heidegger claimed that the ontological supremacy of humans exists in language. Deleuze's recognition of a unique power to live the world inherent only in language-using humans parallels this claim. On the contrary, Deleuze says nothing in this discussion about the animal's world being poor. While it is true that the early Deleuze speaks of animals as being *bêtise* (stupid), he does so wholly under the context of schizophrenia, and not under the subject of animality in natural history.

Now, I would like to import the topic of robots into this discussion of *Welt*, *Umwelt*, and *Weltarm*. This leads us into scrutinizing the tripartite relationship between robots, humans, and animals.

What is important when we consider robots with cognitive ability is their proximity with humans. If the objective of robotics is to make robots act just as humans do, it follows that what is essential for robotics is not the *Umwelt* but the *Welt*. From the outset, the language upon which robots operate is artificial language, the purified form of human language, and if Deleuze is correct in assuming that human language is what makes 'trans-world identity' possible, then this gives further reason for why we must regard the *Welt* as essential for robotics.

Nevertheless, it cannot be denied that both Heidegger and Deleuze define the *Welt* through the medium of the *Umwelt*. The *Welt* can only be construed as the outermost limit of a multiplex overlapping of various *Umwelten*; a *Welt* defined without the *Umwelt* can only be a world of pure idea, or in the Heideggerian sense, a world devoid of anything but a God-given language. Bearing this in mind, it becomes questionable whether or not robotics may, in its attempt to make artificial humans possible, justly ignore the *Umwelt*, the realm of animality and the body. In such a case, not only would the fact that the *Welt* is poor be overlooked, but the aspect of concreteness, namely, that the robot can function only within its environmental world, would also be omitted.

Let's apply the frame problem to this discussion. The crux of the frame problem lies in the fact that, no matter how precise the instructions given to robots are, as long as they are finite, it is impossible for robots to achieve coexistence with the infinite expanse of possibility displayed by the *Welt*, not to mention the ambiguity and robustness that it entails. In this sense, the cognitive abilities of robots seem to be suffering the same

poorness as animals do when compared to humans.

However we must stop and consider the validity of this account. If the acquisition of the Welt and Umwelt are two sides of the same coin, the problem of this argument should rather be the omission of the Umwelt aspect. The Umwelt differs from the idealness of the Welt in that it deals with the body and its form, the aspect of evolution across time of which the body is a manifestation, and the materiality necessary for the self-organization of the self. It displays an infiniteness completely different from the infiniteness ideally displayed by language's 'trans-world identity'. Namely, it displays a material infiniteness. Hence it should be necessary to integrate the poorness of the Welt into our discussion.

<Materiality and the Problem of Infinity>

Here I would like to give the frame problem a certain direction.

As I have already mentioned, the crux of the frame problem lies in the fact that, while living entails an infinite number of possibilities and unpredictable events can happen anywhere, it is impossible to incorporate these factors into robots grounded on a finite number of calculations. Yet organisms seem to be accomplishing this task with little difficulty (although of course there are some limits depending on the species). Needless to say, whether it be animal or human, no life form can completely overcome its physical limits (viable environment, range of perception, motor ability, etc.). Yet one way or another, organisms are capable of avoiding a problem by adopting a different mode of being. In fact, the existence of such capabilities is what makes 'a moving thing' look like a living organism. Thus, what we must consider is the 'intermediate' state of being 'open' towards the Welt while at the same time being within the Umwelt.

Conversely, pursuing only the Welt's meta-structure would result in delimiting the number of possibilities to the ideal of 'language'. This would mean that, while being founded on the natural language of humans, only artificial language and its syntax (which is an abstraction from the former) would be employed. Of course, language-using humans are able to break through the frame problem by creating an ideal world. However applying this feature to robots at this stage would ignore the essential fact that humans are animals as well, and that humans bear the Umwelt's aspect of being 'open'. I believe it is impossible to speak about this domain using an artificial language.

If so, can't we find a solution that goes in the opposite direction, a way to solve the problem of the Umwelt ? I believe the essential point lies in taking into account the robot's materiality and the infiniteness of this materiality.

Here we must consider the fact that the word 'materiality' has many implications.

Let's take Humanoid and the AIBO as an example. It is certain that a sort of materiality, or a communicability of which materiality forms the axis, is integrated into both of these robots. However, what is accentuated in humanoid androids is a materiality related to emotivity, such as a certain feeling or texture. Important in this context is the meaning that connects with an extremely 'human' emotion (rather, what is interesting is the 'uncanny valley' which appears as a robot gradually approaches human likeness, but I cannot go into this any further).

In the case of the AIBO, what basically comes into question is its pet-like size, form, and behavior. Hence the point lies in delineating human meaning beforehand, and approximating the robot to this benchmark to a moderate degree (though of course this moderate degree may be essential). Nonetheless these robots (Humanoid and the AIBO) cannot become human, as their behavior is controlled by artificial language, and they are not subject to natural evolution. It is true that these robots have undergone a huge transformation (evolution) when compared to the stage where cognition was considered only under ideal language and informational communication. But even in these instances, it cannot be denied that the robot's informational aspect – materiality as the replica of a linguilized realm – is all that is being contemplated, rather than the robot's materiality itself.

<The Meaninglessness, Cut off, and Death of Materiality>

Let's return to the frame problem one last time. The frame is a framework of meaning that is itself related to the Umwelt, and deals with the 'openness' of life in all its 'poorness'. In other words, it deals with the impossibility of crossing over various possible worlds (Umwelten) – an act human language is capable of performing. In this connection, what can we derive from correlating the frame problem with the infiniteness of materiality?

Earlier, I took up Deleuze and Guattari's claim that 'machines function by going insane'. The vitalistic materiality expressed by this claim can be discussed effectively at this stage.

In the context of actual organisms, this domain of vitalistic materiality displays a dispersed, material infiniteness – the meaninglessness of life. This runs counter to the Welt, which displays a synthetic realm. Contemplating this realm in regard to actual organisms would lead us to such questions as, why do individual organisms (the transmitters of life) pass over their traits to the next generation while they themselves procreate and die? In response to this question, Freud, who was also a physiologist, gave an explanation using the notion of death drive (Thanatos). Darwinians, on the

other hand, respond with a positive idea that is in a sense opposite to the Freudians. Namely, they claim that individual organisms are cut off by death, and that this self-abolition promotes evolution. This aspect, which seems to make clear the finiteness of individuals, actually opens an infiniteness, the formation of a different Umwelt, by incorporating the possibility of transformation of the biological self.

Of course, Freud's Thanatos possesses an extremely materialistic system of repetition, in that it models the repetition of the inorganic, as opposed to the self-preservative repetition of the organic (cf. *Beyond the Pleasure Principle*). Deleuze and Guattari do not disregard this kind of Freudian Thanatos. This is clear if we consider the fact that it is nothing but the image of death which this Thanatos arouses that they first take up when they illustrate the Body without Organs – the meaningless materiality at the base of organicity.

On the other hand, emphasizing the meaninglessness of materiality by employing the Freudian image of death may lead to something close to Heidegger's idea, which locates death at the limit of the awareness of human life. This kind of death is the limit of individuation enunciated by human language. In this context, it can only be said that the animal's death is poor, not just its world. With such a conception, it would be difficult to depict death as something inherent to life, something that is connected with living itself.

When Deleuze and Guattari claim that 'machines function by going insane', it is not a statement that all machines eventually break down by wearing down. Neither is it an ethical warning concerning security, as the nuclear power plant accident in Japan may call to one's mind. Rather, this statement deals with ontology. Recall the completion of the steam train in the 19th century, when it was rather its accident that attracted interest (for example the photograph of the derailment at Gare Montparnasse). Also recall Roland Barthes, who discerned in the photograph – the image technology of the 19th century – the reality of the 'past' itself, that is, a certain 'presence of death'. In this sense, Deleuze and Guattari's expression marks the culmination of a vitalistic mechanism.

That machines go insane is vital for them to possess a living time, instead of their function being confined to simple repetition. What underpins this conception is that in any instance, life itself forms upon the materialistic.

The materialistic deviates because it cannot completely possess ideality. Unlike the repetition expected by an ideal identity, it comprises a moment where the self suspends – a moment of dismantlement. When Deleuze and Guattari speak of the human mind by employing the concept of machine and take up a materialistic vitalism, what they are

emphasizing is the fact that, as long as organisms are a materialistic life, they will always embody a process in which the self is destroyed. This is not an idealistic death. It simply means that the self, as a substance, is no longer able to move. What this implies is that the organism is no longer able to cope with its Umwelt.

However, there is also a positive aspect to this argument. It indicates that life is able to undertake a self-organizing evolution, and that while it may be Weltarm, it does not have to stay in the same Umwelt; it is able to live the rupture of time. In fact, the manner in which life lives a rupture time is what makes evolution possible.

Let's return to the subject of robots. For robots to achieve a level of cognition close to that of humans, they must first achieve a resemblance with life. Let's examine this from the perspective of the Welt and Umwelt. Here as well, we must take notice of the robot's materiality. A true material existence must have death incorporated into it. Is death incorporated into robots? Is it possible for robots to reproduce themselves by dying? This aspect is something outside the range of the frame problem, yet it is the very aspect that makes the frame problem possible. This actualization of 'time=change', carried out more dynamically by life through the process of procreation, can also be seen to a smaller extent in all organisms, which exercise this actualization in their own 'instant' of rupture=leap. I believe this is what it means to resemble life.

I do not know what reproduction and death may mean for robots. Neither do I know to what extent robotics is seriously inquiring into reproduction and death at the ontological level (that is, the organization of the self into another self, and the incorporation of self-suspension or function rupture, respectively), or whether this kind of topic is regarded as meaningful or not. Nonetheless, if robots are to be created to further resemble life, I believe this kind of topic, which deals with incorporating the dynamism of life itself as a function, is more important than the problem of infiniteness regarding the Welt. The phrase 'incorporating death' may sound hyperbolic, but this is not necessarily true. Viruses are able to restructure themselves in order to adapt to an immune system and thus expand their domain of propagation. Likewise, each part of life is in a sense nothing but the repetitive interplay between this kind of micro-death and micro-life. The apprehension of this realm, which must fundamentally exist as long as robots are material, is, I believe, what philosophy can convey to contemporary robotics for the time being. As long as robotics is a field that deals with the self-organizing, this is a topic that should not be neglected.