Engineering Telos:

Flourishing in the Context of AI and Transhumanism

by Braden Molhoek

In this paper I argue that the Aristotelian notion of *telos* continues to be a central concern in the context of human enhancement and artificial intelligence (AI). Beginning with a cursory examination of what Aristotle means by *telos* and how building on Aristotle, Thomas Aquinas identifies inclinations or desired ends that humans share, the argument will be made that if the capacity for action changes, then it is possible that the nature of humanity has changed as well. Using Aquinas' inclinations as a framework, I will speculate on whether these inclinations would still be relevant in the transhumanist/enhanced human discussion. Following this, the same analysis will be done with AI. I conclude by discussing what some of the possible implications would be if enhanced humans sought radically different inclinations, and what some possible ends for AI could be. By highlighting the importance of the relationship between humans and AI, I attempt to show that certain uses of AI in large scale combat are more dangerous than they are worth.

Aristotle was a biologist as well as a philosopher, and while his biology may no longer be seen as relevant as a scientific field, there are still implications of his thought that affect our understanding of what it means to be human. For Aristotle, everything has a built in *telos*, or end or purpose. Excellence for an entity, then, is living in accordance with that purpose. For example an acorn has the end of growing into an oak tree. Most modern biologists reject any notion of *telos* in the context of evolution. Historically scientists may have seen evidence of design or a grand purpose for nature that came from theological convictions, but the majority of scholars today articulate a notion evolution that is purposeless, without a particular end in mind. There are some scholars that still see room for *telos*, such as the belief that evolution has a tendency towards complexity, but this is a far cry from Aristotle's biological view. Aristotle believed that humans shared a great deal with other organisms, even though he had no notions of genes or DNA. The end for humans, he argued, was different from that of other organisms because humans had some unique aspects. All

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life shared in feeding in some way and biological growth, but humans had the capacity of reason, and so whatever the end of humans was, it must involve reason in some way.[1]

One of my colleagues at Santa Clara University, Brian Green, provides a useful frame for the discussion of the *telos* of humanity in an evolutionary framework that includes transhumanism. Green is the Director of Technology Ethics at the Markkula Center for Applied Ethics and although he argues from a natural law perspective, his perspective is still valid for the stance I am taking. Like natural law, virtue is a form of ethical naturalism, that is, a perspective that relies on deriving "moral norms

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from human nature."[2] It is also teleological because Thomas Aquinas, drawing from Aristotle, believes that "all creatures naturally seek certain ends."[3] There are five inclinations that humans seek for Aquinas: "survive, reproduce, educate the young, live in society, seek truth."[4] Given that Aquinas lived in the thirteenth century, it is important to ask whether the inclinations of humans have changed since then.

Although not all of these five inclinations have the same prominence in modern society that they might have had in the thirteenth century, I believe that they are all still relevant to modern humans. The inclination that is the least likely to translate to modern society is that of seeking truth. What the truth is and who articulates it has become increasingly harder to determine, but even so, the truth does seem to have some importance for people today, whether it be to

inform citizens of a democracy or to have proper intelligence to know what threats are legitimate. For these reasons I think that Aquinas' five inclinations remain important enough to continue to utilize them as an understanding of the *telos* of humanity.

Green is able to address this question as well as show how answering this question is of particular relevance to the discussion of transhumanism. Both the biological nature and cultural nature of humans is subject to change. Historically, humans would have had little no control over their biological nature, but between assisted reproductive technologies and advances in genetic engineering, humans are able to affect more change than ever before, and this is on top of the small changes that occurred naturally through evolution.[5] Human cultural nature has always been susceptible to change, but technology is also increasingly playing a larger role in these changes as well. Drawing on the Thomistic notion that "action follows being," Green argues that if "our capacity for action has changed, then this implies that our being may have changed as well."[6] I will return to this issue in the conclusion, after reflecting on how transhumanism and AI might relate to Aquinas' inclinations.

Returning to the natural inclinations that Aquinas lists for humans, I will use these five inclinations as a starting framework to examine how the potential inclinations of enhanced humans. Not all of these inclinations, however, are relevant for large scale combat. In the instances where there is less of a connection to large scale combat, I will attempt to expand these inclinations to include things that are more relevant for warfare. Following the discussion of enhanced humans, I will then turn to AI. The discussion of enhanced humans and AI are separate because I believe that by using the five inclinations Aquinas identifies, clear differences emerge between these technological advances.

Transhumanism/Enhanced Humans

Survive

The inclination to survive is the first on Aquinas' list and is also the most relevant for large scale combat. Enhanced soldiers, whether they were humans or a new species, would have a desire to continue to live. Compared to many people in this country, those who serve in combat are acutely aware of how fragile life can be. While self-survival is clearly important, there is also an emphasis placed on saving lives as well, be it their fellow soldiers or innocent noncombatants. Minimizing the casualties of war is a positive end to seek, and there are a variety of ways that enhancements could help reduce casualties. If soldiers had synthetic blood, they could be equipped with something that slows down bleeding in a chemical way not possible with natural blood. Heightened reflexes could allow soldiers to avoid oncoming attacks. Contacts that allowed for a head's up display could track incoming fire or detect explosives in the vicinity of the wearer. It is difficult to not at least tacitly endorse defensive enhancements that would increase soldier's chances of survival.

The only exception or distinction that I can think of in terms of survival is if survival is not dependent on bodily integrity. If a post human species is able to upload their consciousness into biological, mechanical, or hybrid bodies, then survival of the body might not be important. Assuming a recent or ongoing backup of one's consciousness, survival of the body would not be necessary because if a soldier were to die, their mental backup could be loaded into a new body. This would allow for novel strategies but could also lead to a dehumanizing of soldiers. If people are defined by their consciousness only then will bodies be given less respect and soldiers expected to take more risks?

Reproduce

Reproduction is not something that is immediately relevant to combat, but soldiers are people who might consider reproduction while in the service or upon retiring. After examining some of the implications of enhancements and reproduction, I will bring two additional concepts into the discussion. The first is that of replication of results, that is, is it worth the investment to enhance humans because of how easy it might be for others to reverse engineer the results? The second concept brought in will be that of destruction or lethality. Enhancing humans for combat could include making them more lethal, increasing their destructive capability and limiting the chances for their opponents to reproduce.

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Reproduction is an inclination that has changed from the time of Thomas Aquinas. People are able to exert more control over their reproductive choices in part because of science and technology. Birth control and contraceptives can be used if people are choosing not to reproduce, and assisted reproductive technologies are allowing people to have children who otherwise would be unable to do so. While not immediately relevant to combat, there are questions raised if an enhanced soldier, on active duty or retired, wishes to reproduce.

The major concern in this context is about the nature of enhancements and whether they would transmitted to the next generation. If soldiers are using removable enhancements, such as contacts that allow for night vision, then it is clear that such enhancements will not affect their children. The same could be true of genetic enhancements as well. Unless gene editing was done to germline cells, the genetic changes of an

enhanced human would not be passed on to their children. If for some reason germline changes were made, for example, if enhancements were made in the embryonic stage before cell differentiation occurs, then enhancements would be passed on to their children. It seems likely retired soldiers would need to relinquish any removable enhancements when they leave active duty, but would the military or the government also reverse genetic enhancements? While this seems unlikely, it does raise concerns about the security of developed enhancements and whether others could replicate the results.

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Gene editing has made major strides within the past five years, with the discovery of the CRISPR technique. Developing genetic enhancements for humans might seem the best approach to provide a technological edge in warfare, but it is likely the least secure way to do. Any proprietary advances in genetic enhancement have to be introduced into subjects in order to work. Causalities, prisoners of war, or even DNA left in any combat zone provides all the information necessary for enemy agents to identify the gene sequences of any enhancements. While the same could be said of technological advances such as vehicles or drones, there are steps that could be taken to destroy or encrypt sensitive information that would be more difficult if not impossible in human subjects.

Educate the Young

Although the education of the entire population is not central to the mission of the military, the education of potential recruits, officers, and the continuing training of active service men and women is extremely important.

Technology can certainly play a role in improving education and training, from providing more interaction for students, to utilizing virtual reality to simulate a variety of combat scenarios. There is already research being done to try and enhance human mental capacities through implants. DARPA funded research at Wake Forest Baptist Medical Center has been testing a neural implant that is intended to be able to identify brain states when learning new information, and to imitate those states to artificially increase memory. The sample size is small, only fifteen participants, but subjects short term memory increased by an average of thirty-five percent.[7] As was the case in the discussion of replication of data, neural implants are not without their own security issues. Around the same time of the announcement of the results of the study just referenced, researchers in Belgium found that neurostimulators' wireless signals are easy to hack with easy to access technology. The kind of information that could be intercepted includes passwords, PINs, and could theoretically extend to call signs and classified information. The good news is that researchers believe security could be improved by harnessing the power of the brain itself. Current technology relies on software to create random numbers, but these numbers are never truly random. Instead, researchers suggest that the brain be used as the generator of random numbers.[8]

Live in Society

Live in society can refer to a number of things. First and foremost, it addresses the social nature of the human species. Humans need to be in contact and in relationships with others for their emotional well-being. For the military, I choose to focus on two aspects of living in society: living in the community of active service men and women, and living in society after active duty. There are a variety of elements of what thriving in military life looks like that I, as a civilian, cannot even begin to imagine.

However, it seems that there are several things that could contribute to living well in the active service. The first of these I will address is the ability to bond with those with whom you are serving. Although empathy is not something that is traditionally thought of when speaking of enhancing humans in the military, it is possible that in limited applications doing so would promote cohesion within a unit and increasing their ability to work together.

I have been published elsewhere making the argument that increasing one's capacity for a particular trait or disposition does not make one a better person, it just increases their ability for that behavior.[9] Enhancing people's empathy may make them more empathic, but it does not make them more virtuous. The mean that constitutes a moral virtue for Aristotle or Aquinas is distinct for each individual, and is also related to their natural capacities. If you increase a capacity that contributes to virtue, it raises the bar for what the mean is.[10] Enhancing empathy would be just as helpful when living in society as a retired soldier. The bigger question, in my opinion, is what enhancements would be most helpful for service men and women leaving active duty and returning to civilian life? Given the reports of mental health concerns that veterans face, it would seem helpful not only for veterans but for society as a whole, if the military could provide enhancements to veterans that contribute to their flourishing in society.

Seek Truth

As stated previously, seeking truth appears to play a less prominent role in modern society than it might have in the past, but there are elements of seeking truth that are not only relevant, but quite important for the military, accurate intelligence and real time data from the field. Contacts for soldiers have been mentioned previously but again, this is an easy to image enhancement, with recording and transmitting capabilities to provide command with real time

data and allow for better coordination. Again, there are concerns about the security of that data and whether the enemy would be able to access the feed, but this is not an insurmountable problem. Other enhancements that could help in the field could include biofeedback sensors when interrogating prisoners or speaking with unknown persons in the field. Being able to scan for microexpressions that could illuminate one's state of mind, or heart rate or other factors that are used in polygraphs to determine whether someone is attempting to deceive. Current levels of technology would probably not be very accurate, but if improvements could be made, including making the equipment wearable, it could greatly enhance the chance of getting reliable intelligence, potentially saving lives and increasing the success of missions.

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Artificial Intelligence (AI)

Survive

Survival for AI is slightly more complex than it was for enhanced humans. Given the financial investment, it would seem likely that AI used in combat would be programmed for self-preservation in most circumstances. Isaac Asimov's classic three laws of robotics provide the likely exception to the rule. These laws are: "A robot may not injure a human being or, through inaction, allow a human being to come to harm. A robot must obey the orders given it by human beings except where such orders would conflict with the First Law. A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws."[11] Self-preservation or survival is the third law

and can be overridden if the first or the second law requires it. Although most researchers agree these laws are inadequate, they provide a concrete example of how survival may or may not be a programmed priority for AI.

It is also probable that AI will not be seen as having the same intrinsic value as humans, so there may be situations in which AI would be called upon to sacrifice itself in order to save humans. The purpose of specific AI may also make it impossible to emphasize or even allow survival. There already exists a classification of weapons called "smart bombs," but it is not difficult to imagine autonomous weapons such as missiles, that have facial recognition software and are capable of searching for and identifying their targets on their own. Unless the software is separate from the weapon, such as a weapon equipped drone, the weapon would need to destroy itself in order to achieve its objective.

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Reproduce

It is an important question to ask whether humans would want to instill, or perhaps install, an inclination to reproduce for AI. Because humans will shape the ends of AI with the decisions they make regarding their programming, one could make an argument for both sides. Giving AI the desire and ability to reproduce could lead to improvements in programming. As AI become more intelligent they may be better equipped than software engineers to know how improvements can be made. Doing so, however, could lead humans to lose an understanding of how resulting AI think or are programmed. Because of this, it could also be argued that by not giving AI the inclination to reproduce, humans are able to have more control over the development and evolution of AI.

Educate the Young

Given how reproduction for AI was framed, there is significant overlap in discussion. Machine learning is becoming more complicated and programmers are becoming less sure about how the learning is actually occurring. Whether or not AI will be allowed to reproduce on their own or if they will just educate the next generation of AI or even humans, there are implications for human interaction with AI. If humans are less certain of how human action is shaping the future of AI, then it would be advantageous for AI to be programmed in such a way that a priority is to be able to explain to humans what changes are being made or how AI is learning.

In the context of military use, finding ways to translate the kind of training soldiers get to be useful for AI would be helpful. AI will be able to observe footage of simulated and actual combat, but being able to make sense of what is happening, what is most relevant, and how humans come to make decisions is ultimately of more importance for machine learning. AI have been successful in mastering games like chess and Go because there are rules and the data is annotated. In other words, the history of movement for each piece is known. In these kinds of contexts, AI can generate far more examples by playing themselves than just observing humans. The more data, the better the results. So after only millions of human games observed, the AI could beat an average Go opponent, but after playing itself billions of times, AI could now defeat the best human.

Live in Society

I believe that the inclination to live in society is probably the most important issue for AI and its use in combat. If AI becomes increasingly only used for military purposes and they do not develop any other roles in

society, this will strongly shape the *telos* of AI. If AI are programmed to kill humans, then that could be how they begin to identify their relationship with all humans, whether they are enemy combatants, civilians, or friendly forces. If, on the other hand, AI are programmed to see value in human life and to only disable human targets, or even avoid human targets altogether, this promotes an understanding of how AI and humans relate to one another that creates a more positive relationship between AI and humans. So while the use of AI to face off against enemy combatants may be attractive, particularly because it would result in fewer friendly casualties, there are implications for human/AI relationships if that use is pursued.

Like the inclination of reproduction for enhanced humans, it is possible that the use of AI in combat would reduce the chances of the enemy being able to reproduce. Patrick Lin has argued that AI that can kill each and every shot are a violation of human dignity, as well as possibly undermining or violating laws or guidelines for war. Not all enemy combatants choose freely to fight, and that people generally have a right to life has lead humanitarian groups to create guidelines for how lethal weapons should be in warfare. The International Committee Red Cross, for instance, argues that new technologies should not kill more than one fourth of the time and not injure people to the point of a greater than five percent chance of dying in a hospital seeking treatment for their injury.[12] This is perhaps another reason to support uses of AI in combat that do not target humans directly.

Seek Truth

At this point it is not possible to speculate with any certainty whether AI would have an inclination to seek the truth. Most programming is designed to accomplish a particular task, and the success of the code is whether the desired task is carried out. Programmers could want AI to have values such as efficiency and accuracy, but I am unsure how AI can be programmed to determine what the truth is, even though computers are being used to try and identify fake news and accounts that post it. What is easier to imagine is how AI could be used to help humans seek truth, particularly the kinds of truths discussed in the transhumanism section, accurate intelligence and real time data from the field. Drones of various sizes, acting autonomously or in cooperation with one another could provide views that soldiers are not capable of and do so faster and cheaper than satellites are capable of doing. Besides the position of enemy troops and getting immediate feedback on a mission, AI could constantly be infiltrating anywhere the enemy is believed to be, far beyond the scope of active combat zones.

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Conclusion

In this brief analysis, I have focused on enhancements and development of AI that do not differ substantially from the inclinations that Aquinas lists. It is in this final section that I want to raise concerns of what could happen if the inclinations of transhumans/enhanced humans and AI diverge greatly from that of modern humans. If soldiers were to enhanced in ways that led to a disregarding to survival and reproduction, whether their own or that of their enemies, such a shift would be significant for me to say that such individuals may not be human in way that unenhanced humans are. If survival, whether individual or that of the species as a whole is no longer there, that would significantly different than most life that is currently known. The end for such beings would not be that of flourishing that Aristotle envisions for humans, a life well-lived with the cultivation of the virtues over time. Rather, the end of such enhanced

beings would be inextricably linked to combat and victory, at any cost. Such individuals would also find living in society difficult if not impossible because of how their understanding of life and death have changed.

Several times in the discussion of AI I raised the issue of the relationship between humans and AI. In my opinion it is important to instill a positive understanding of humans into AI's purpose. Doing so includes the future and flourishing of humanity in the purpose and the ends that AI pursues. Failing to do could create an adversarial relationship, where there is competition between the two types of beings where only one can flourishing. Science fiction is full of examples of how AI and humans could come into conflict and what the repercussions of that conflict could be. If humans are presented as targets that AI should eliminate, it should not be a surprise that this is not just how AI will view the enemy, but how it will come to see humanity as a whole. Therefore, I would urge caution in what roles AI plays in large scale combat and suggest that AI be used for intelligence gathering and the disabling of nonhuman targets. ***IAJ***

NOTES

1   Aristotle, *The Nicomachean Ethics*, further rev. ed., trans. J A K. Thomson (London: Penguin Books, 2004), 16.

2   Brian Green, "Transhumanism and Catholic Natural Law: Changing Human Nature and Changing Moral Norms," in *Religion and Transhumanism: The Unknown Future of Human Enhancement*, ed. Calvin Mercer and Tracy Trothen (Santa Barbara: Praeger, an imprint of ABC-CLIO, LLC, 2015), 201.

3   Ibid, 203.

4   Ibid, 210.

5   Ibid, 205.

6   Ibid, 206.

7   Brandon Specktor, "Military-Funded Study Successfully Tests 'prosthetic memory' Brain Implants," Live Science, April 6, 2018, https://www.livescience.com/62234-prosthetic-memory-neural-implant.html.

8   Thomas Claburn, "Surprise! Wireless Brain Implants Are Not Secure, and Can Be Hijacked to Kill You or Steal Thoughts," The Register, April 18, 2018, https://www.theregister.co.uk/2018/04/18/boffins_break_into_brain_implant.

9   Braden Molhoek, "Raising the Virtuous Bar: The Underlying Issues of Genetic Moral Enhancement," *Theology and Science* 16, no. 3 (June): 283, 286, http://dx.doi.org/10.1080/14746700.2018.1488474.

10   Ibid, 286

11   Christoph Salge, "Asimov's Laws Won't Stop Robots from Harming Humans, so We've Developed a Better Solution," Scientific American, July 11, 2017, https://www.scientificamerican.com/article/asimovs-laws-wont-stop-robots-from-harming-humans-so-weve-developed-a-better-solution.

12   Erik Sofge, "The Mathematics of Murder: Should a Robot Sacrifice Your Life to Save Two?," Popular Science, May 12, 2014, https://www.popsci.com/blog-network/zero-moment/mathematics-murder-should-robot-sacrifice-your-life-save-two.