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Title: Technological Innovation: Challenges to the Profession for Army Stewards

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Abstract: Stewards of the Army profession face many challenges in the coming years as they shape the future force of the United States Army in an era of declining resources. There are compelling arguments that the greatest trials the Army faces involve such things as degraded civil-military relations, the erosion of trust with the Army's client - the American people, and a growing corrosion of identity amongst Army professionals. While each of these is significant, another significant challenge the Army must confront involves the infusion of technological breakthroughs, and the impact they will have on the human dimension of warfare and a values-based Army. One need only look to the current use of aerial drones to imagine the technological possibilities of the next ten to fifteen years. Regardless of what the technological breakthroughs may be, one thing remains certain; they create daunting challenges for stewards of the profession to ensure they do not adversely affect values and the ethic of the United States Army. This paper attempts to highlight some of the unique challenges to the values of the profession, the Army's ethic, and the human dimension of warfare that the continuous infusion of technology will present in the future as killing is increasingly done by machines. The Army's strategic leaders, the true stewards of the profession, must be aware of these challenges, anticipate them, and set in motion now the systems necessary to combat them. These obstacles are not yet a crisis and there is time to implement things such as a multidisciplinary approach to assessing the impacts of technology to prevent the decline of the Army profession. If the Army wants to remain a profession in a future environment that will likely include genetically enhanced Soldiers and autonomous killing machines, it will find a way in the coming decade to overcome the challenges of advancing technology to its professional values and ethic. The Army's strategic leaders, the stewards of the profession, must lead this effort.

Technological Innovation: Challenges to the Profession for Army Stewards

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Stewards of the Army profession face many challenges in the coming years as they shape the future force of the United States Army in an era of declining resources. There are compelling arguments that the greatest trials the Army faces involve such things as degraded civil-military relations, the erosion of trust with the Army's client - the American people, and a growing corrosion of identity amongst Army professionals. While each of these is significant, another significant challenge the Army must confront involves the infusion of technological breakthroughs, and the impact they will have on the human dimension of warfare and a values-based Army. One need only look to the current use of aerial drones to imagine the technological possibilities of the next ten to fifteen years. Regardless of what the technological breakthroughs may be, one thing remains certain; they create daunting challenges for stewards of the profession to ensure they do not adversely affect values and the ethic of the United States Army.

The United States Army defines stewardship of the profession as its "moral responsibility to ensure the long-term effectiveness of the Army as a military profession."[1] Additionally, one of the concepts emerging from the recent Army Profession Campaign is the "renewal of the unique aspect of the identity and role of the strategic leaders of the Army – the sergeants major, colonels, general officers, and members of the Senior Executive Service – as the 'stewards of the Army Profession.'"[2] In light of this definition and concept, it is clear it is up to the strategic leaders of the Army, the stewards of the profession, to figure out how to shape the profession for the future. The Army recognizes that "predicting specific science and technology capabilities ten to twenty years in the future is difficult", but it also recognizes "it is safe to say that capabilities developed to improve the human condition will find military

applications and vice versa."[3] Despite these difficulties, as the stewards of the profession shape the future, they must account for the affects of technology to ensure they don't inadvertently damage the ethic of the profession.

As more and more lethal and autonomous machines incrementally, but inevitably enter the future battlefield, such development "raises not only complex strategic and operational questions but also profound legal and ethical ones."[4] In the next fifteen years it is not beyond the realm of possible to imagine battlefield deception platoons of combat vehicles that appear real to adversaries but only exist in the cyber world based on quantum computers and cloud based computing. Even more formidable would be squads and platoons of unmanned Soldiers – robots – that fight the nation's wars under the direction of a select group of genetically enhanced humans. According to Lieutenant Colonel Joseph Hitt, an engineering doctorate and Program Manager for the Defense Advanced Research Projects Agency (DARPA), the Army is not far from that reality. DARPA intends to field a prototype hybrid squad during a Joint Readiness Training Center exercise in Fiscal Year 2017. Squad X, as the squad is known in research circles, is comprised of sensor enhanced humans controlling land based robots and organic unmanned aerial vehicles (UAVs). Squad X will possess organic signals intelligence and highly advanced communications systems and will be lethal out to ranges that today's Army leaders cannot imagine. According to Lieutenant Colonel Hitt, Squad X is a low risk project for DARPA, meaning it will happen.[5] While such possibilities are certainly attractive, especially as they reduce the risk of warfare to human life, the Army's stewards who are pushing such programs must always remember that warfare is a uniquely human endeavor and every action has

consequences for human beings and the profession. These stewards would do well to remember that,

> Science and technology matters and will make a major difference in how the military operates in the future. Accepting that, the Army cannot afford not to adapt and adopt new technology as it emerges. At the same time, the Army must never forget Patton's dictate that wars may be fought with machines but they are won by men and women."[6]

These same men and women are precisely why the Army must protect itself as a profession.

As organizations such as DARPA strive to create systems for the United States' military, and stay in front of potential adversaries, it seems reasonable they would employ a multidisciplinary approach that fuses technological advancements with a study of their moral and ethical impacts on the human dimension. In fact, the Army's recent study of the human dimension in the future claims, "science will continue to investigate the physical, cognitive and, to some extent, the moral components of the human dimension." [7] Apparently, however, in practice this may not be happening. For example, DARPA is rapidly moving forward with the development of operational humanoid robots, but it is "not having discussions about the ethical implications of doing so – it is just building them."[8]

The key to successful technological infusion must include an assessment of second and third order effects. Even something as seemingly innocuous as the development of an exoskeleton suit that allows any Soldier to run a four minute mile regardless of his actual physical condition will have an impact on the values of the profession as a whole and those of the individual wearing it. If the Army believes physical fitness is one part of holistic individual fitness, as it claims to, then it should

study the impacts of enhanced physical performance on the other components of an individual's fitness such as mental, moral, and spiritual fitness. When taken to the next level, it is reasonable to believe that in ten to twenty years Soldiers will not just be wearing such suits, but they may have genetic implants that will allow them to hear exponentially better, see ten thousand times faster, and operate without the need for sleep.

> "In the near future, such internal enhancements will rely on mechanical augmentation, drugs, and psychological behavior modifications. In the longer term, gene manipulation may strive to improve human performance while nanotech implants dispense advanced drugs to increase efficiency of the physical processes. A challenge for any program or project seeking to enhance human performance will be to carefully investigate and define the trade-offs. The human experience provides few if any examples of technologies that confer benefits without an attendant risk."[9]

It is the job of the Army's strategic leaders to manage that risk.

Additionally, the pace of technological advancement is profound specifically in the areas of quantum mechanics, physics, and quantum computing. In ten years it is quite possible that the Army could possess a robot that can think and act faster than a human. In this environment "strategic leaders cannot make decisions about technology with common sense anymore based on their past experience, they must have an in-depth understanding of it."[10] These same strategic leaders must also have an in-depth understanding of the impact of technology on the Army's people, and on the institution's ethic and values. Said another way, the profession's stewards "must be conversant with new technologies and comfortable in their integration into all aspects of the Army mission…Keeping pace with science and technology developments is a professional responsibility and an institutional imperative."[11]

Clearly the impact of technology on the Army in the next decade will be great. As such the Army should not wait for technology to evolve before making decisions about its potential impact on the human dimension and the values of the profession. The time is now for the ethical debate about human enhancement and use of robots. As Kenneth Anderson and Matthew Waxman of the Hoover Institution argue,

> …technology and weapons innovation does not take place in a vacuum. The time to take into account law and ethics to inform and govern autonomous weapons systems is now, before technologies and weapons development have become 'hardened' in a particular path and their design architecture becomes difficult or even impossible to change. Otherwise, the risk is that technology and innovation alone, unleavened by ethics and law at the front end of the innovation process, let slip the robots of war.[12]

As technology marches forward, the Army claims it is "aggressively attempting to find the correct balance between human dimension needs and science and technology initiatives."[13] If so, it would be beneficial for the Army to increase its population of officers who have studied ethics and philosophy in order to help the institution make sense of the use of technology to do the nation's killing in combat. Organizations such as DARPA should employ a multidisciplinary approach to research and development; one that incorporates such fields as ethics, psychology, and sociology. At a minimum, the Army in conjunction with the Department of Defense, could commission a near term study to determine the moral and ethical impact that remote killing is having on those men and women that operate drones in the current fight against violent extremists. It seems intuitive that such a study would produce fascinating results that could serve as a starting point for further research into the future use of similar autonomous systems to ensure the institution remains "a values-based Army responsive to the demands of the moral component of the human dimension."[14] The good news is the Army Profession

Campaign, begun in 2010, which has now resulted in the "America's Army – Our Profession," education program of 2013 has put the Army on the right path for the creation of an identity of stewardship to address such concerns.[15]

In conclusion, this paper has attempted to highlight some of the unique challenges to the values of the profession, the Army's ethic, and the human dimension of warfare that the continuous infusion of technology will present in the future as killing is increasingly done by machines. The Army's strategic leaders, the true stewards of the profession, must be aware of these challenges, anticipate them, and set in motion now the systems necessary to combat them. These obstacles are not yet a crisis and there is time to implement things such as a multidisciplinary approach to assessing the impacts of technology to prevent the decline of the Army profession. If the Army wants to remain a profession in a future environment that will likely include genetically enhanced Soldiers and autonomous killing machines, it will find a way in the coming decade to overcome the challenges of advancing technology to its professional values and ethic. The Army's strategic leaders, the stewards of the profession, must lead this effort.

Endnotes

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[6] Headquarters, United States Army Training and Doctrine Command, *The U.S. Army Study of the Human Dimension in the Future 2015-2024*, 179.

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[8] Lieutenant Colonel Joseph Hitt, telephone interview by author.

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