

I recently had the pleasure of reading a copy of Paul Scharre’s [*Army of None: Autonomous Weapons and the Future of War*](#) and it quickly became the book I recommend to any leader wishing to understand the complexity of autonomous systems. He provides readers with the most up to date legal, moral, and technical aspects of autonomous weapons and their impacts on the future of war. Tech already plays an important role in the military, and it’s only increasing. *Army of None* is a great place to begin thinking about it’s utility in future conflict. Last week I caught up with Paul and he shared his thoughts on autonomous weapons and war.

Joe: Does the current DoD policy state that we will always keep a person somewhere in the autonomous weapon decision chain?

Paul: The official DoD policy on autonomous weapons does not require a human in the loop. That’s a common misconception. However, when senior DoD and military leaders talk about autonomous weapons, they often say “We intend to keep a human in the loop.” The official policy actually gives a lot of latitude. And it lays out a series of guidelines and processes for

gaining approval to include increased autonomy in weapon systems.

Joe: Where do you think we will fight the first battle of autonomous weapons vs. autonomous weapons? State actors or non-state actors?

Paul: The first autonomy vs. autonomy will likely take place in cyber space. Autonomy is moving forward in leaps and bounds and there are so many compelling pressures to take humans out of the loop because of speed. For instance, when you are operating on the enemy's network you might not have persistent access and the time to move at the speed of human decision-making, so you will need something that's able to operate out on it's own. I think you will see an increase in autonomous systems operating on their own, battling it out on computer networks.

Joe: What impact will autonomous weapons have on the character and the nature of war?

Paul: Let me take each of those in turn. The character and nature of war are hot topics that people like to discuss. With regards to the character of war, we are likely to see some major disruptive shifts in warfare in terms of scalability that autonomous systems allow. This includes both physical systems like swarms and digital systems like bots.

I think we are likely to see the speed of warfare increase. The pace and volume in which information is processed is just one example of this. There are going to be a lot of tools that will help us do this, but on the other hand, if the enemy is moving faster than we are, it's going to be even harder to catch up.

Some people envision a future of bloodless wars with robots fighting. I think this is highly unlikely. We will see robots increasingly incorporated into military operations, including on the front lines. This will give warfighters greater standoff from the enemy, but I think we

are still going to need people on the battlefield. One reason for this will be the challenges of communications in a contested electromagnetic environment. Communications are easier in these environments at shorter ranges.

We may see small tactical units of robots, but I see a continued role for humans on the battlefield to quarterback the fight. One thing machines are not good at it right now is reacting to novelty. Humans are good at flexibly adapting to novel situations, and because the need to adapt is central in warfare, we will always need humans forward in the fight.

I think there is an interesting question about as this revolution gets underway, is there some culminating point where we see so much change that it changes the nature of war itself?

Many take a dogmatic view and say that the nature of war is unchangeable. If we say that the nature of war has not changed in the past- that might be a fair statement. But, if we say that the nature of war will NEVER change-that isn't a scientific statement. That's a statement of faith. And I don't think that faith-based ideas on the future of war is a good way to go about preparing for what the enemy might bring to the table. We need to think hard about the nature of war and ask ourselves, "Are there some conditions in which the nature of war might change?"

I think one of those conditions might be when the speed of action eclipses the speed of human decision-making. Some [Chinese scholars have written about a "battlefield singularity."](#) Its already happening with some areas at the tactical level, but if it happens at the operational level, the very nature of war itself may change.

Joe: A lot of the R&D on autonomous systems is happening outside the conventional Army? Do you think leaders at the brigade level and below should start getting smart on AI?

Paul: Yes. I think it's vital for leaders to start understanding some of this technology and to

think about how to apply it. Throughout history, there have been disruptive technologies and armies have wrestled with their implications: how to best organize forces, adapt doctrine, and how to turn their new technology into a competitive advantage.

The Army has a mythology that it tells itself about innovation during the interwar period between World War I and World War II. The tank is a great example of a new technology coming in and driving dramatic changes in warfare and requiring innovation by all the major powers. Yes, the Army took this new piece of technology and did all sorts of testing like the Louisiana Maneuvers and developing new doctrine based around the tank.

But what is often left out of this mythology is that the Army was really late to the game on this. If we were geographically in the same position as France war during WWII, we would have lost the war, because we weren't ready. As late as 1943, we still had senior leaders thinking the role of the tank was to support the infantry. These leaders weren't dumb and they weren't trying to come up with bad ideas, but this point highlights the fact that it's very hard to foresee what new technology might unlock.

While I applaud the Army for their new strategy on robotics and autonomous systems, it still comes up short conceptually. The Army hasn't yet started to grapple seriously with armed robots, and the Army is behind our adversaries on this front. The other thing that I think misses the boat a bit in the Army's strategy is the assumption is that we will always human-robot teaming in conventional forces. I think we also should be willing to explore the idea that there might be tactical units on the battlefield that entirely robotic, operating under human control. There might be value to that in some settings and we shouldn't arbitrarily constrain innovation.

Joe: Besides [Army of None](#), what resources would you suggest leaders check out to begin thinking about AI and how it will influence future wars?

Paul: We're working on pulling together a reading list on artificial intelligence that will go

up on our website: cnas.org/ai.

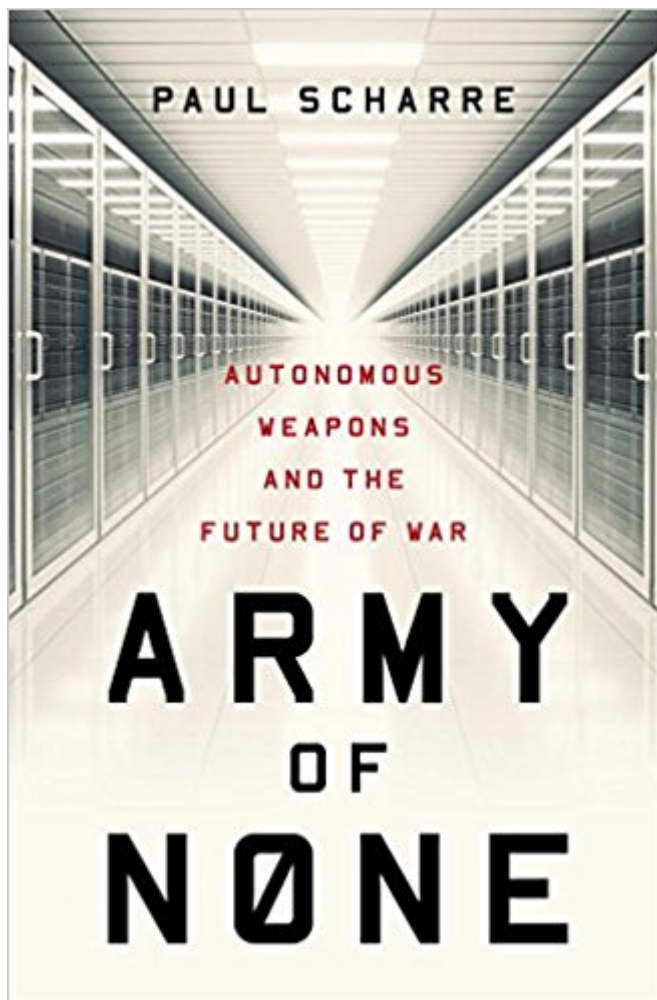
Joe: What warning would you give junior leaders serving in the Army today who might be the future senior officers and NCOs for the next war?

Paul: Junior leaders need to do a lot more to prepare for a world of radical transparency. We live in an era where everyone has a smart phone, everyone is recording what you do. The link between the strategic corporal and CNN is getting closer and closer. We need to be ready for that and make sure our junior NCOs are prepared for a world where every single action they take could go viral and change the course of the conflict. We need to create training environments that train Soldiers to be very lethal, but at the same time, understand the public diplomacy aspects of war.

I don't think the junior leaders are going to have a problem adapting to major changes on future battlefields. The senior leaders also get it. The problem will be the middle of the bureaucracy—the LTC and COL level. At this level, the Army creates roles for people in the middle of the bureaucracy that values processes over innovation. The bureaucracy will beat the innovation out of people. Our people are innovative. We need to create a system that unleashes that innovation.

A former U.S. Army Ranger who served in Iraq and Afghanistan, [Paul Scharre](#) is the director of the Technology and National Security Program at the Center for a New American Security; he is also a contributor to Foreign Policy, Politico, and the New York Times. He lives in Virginia.

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