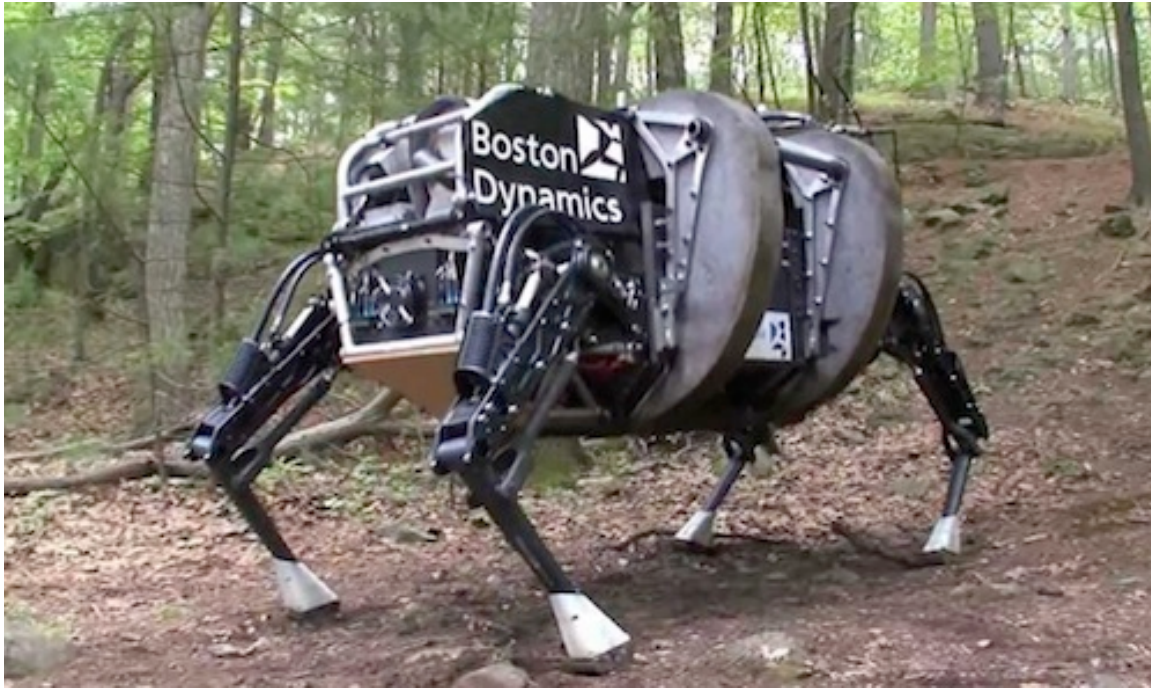


Warfare of the 21st Century:
Cyber Attacks, Super Soldiers, Ghost Ships, and Laser Beams

By Mary Beaudoin



Something that nightmares are made of. BigDog, a rough-terrain robot that walks, runs, climbs, and carries heavy loads. BigDog is the size of a large dog or small mule; about 3 feet long, 2.5 feet tall and weighs 240 pounds. It was developed by Boston Dynamics with DARPA, as part of a robotic collaboration with the U.S. Army Research Laboratory.

Photo: DARPA

The 20th century was fought with industrialized weapons. In the twenty-first century, the technology already exists and/or is evolving to create a new generation of warfare that implants human brains to form cyber soldiers, sets ghost ships to sail without human crews, destroys foreign facilities without ever leaving the country, directs electronic energy secretly, and can alter the environment to cause earthquakes and hurricanes.

How is this happening? The Department of Defense is working with pioneering companies, start-ups, entrepreneurs, military and university labs, and weapons manufacturers to accelerate research and development and eliminate barriers to technological innovation of warfare.



The Pentagon and Silicon Valley Connection

The hip-to-be-square U.S. Secretary of Defense Ashton Carter began the year at the World Economic Forum at Davos, remote in the Swiss Alps, where he mingled with computer industry CEOs of Microsoft and Hewlett-Packard, among the elite in business, government, and even show biz.(1) On March 2, in San Francisco, Carter established the Innovation Advisory Board of the Department of Defense and welcomed Eric Schmidt, the executive chairman of Google's parent company, Alphabet, Inc. to the chairmanship; (2) later to be joined on the board by the chairman and founder of Linked In, Reid Hoffman, along with Walter Isaacson, the biographer of Apple founder Steve Jobs. The reciprocal relationship between the tech industry and the Pentagon on the highest level became even more evident with the addition to the DOD board of William McRaven, commander of SOCOM (the U.S. military's Southern Command which encompasses Central and South America).(3)

Carter has also developed a working relationship with Facebook's Chief Operating Officer Sheryl Sandberg revealing another side to the COO of the wildly popular social media. When Sandberg visited Arlington in 2015, the Secretary announced that it was "a great pleasure and privilege to welcome once again to the Pentagon Sheryl Sandberg, who's been here before, and takes a strong interest in this place, and has strong expertise in our mission, and I'm so grateful to her for the attention she—she [sic] pays to this wonderful institution."(4)

And she is not the only one to pay visits to the Pentagon. At the recent Defense One Tech Summit on June 10 in Washington, D.C., Chris Lynch, an Information Technology (IT) expert plucked from a private company, explained nonchalantly that the gray zip-front hoody, is his official DOD uniform. Lynch is ensconced there as the director of Defense Digital Service where he launched the "Hack the Pentagon" project challenging computer nerds in an effort to detect vulnerabilities.(5)

But the Silicon Valley tech realm reaches far beyond the obvious with social media, IT, and data protection. When she spoke at the defense industry conference, Teresa

Carlson of Amazon Web Services, which has provided cloud computing for both the DOD and intelligence communities, recommended that those on the front lines know best: “Let your war fighters innovate.” And, perhaps portending more direct involvement in foreign endeavors by technocrats with specific expertise, she said of specialists running IT and data: “We should be involved in ‘mission.’”(6) [emphasis this writer’s]

What do Silicon Valley and the Pentagon have in common? Bottom line: By combining efforts, they can both make a killing—though they may define that in different ways. Information and communication technology is where the money and action are. Ironically, some of the same tools can be used for cross purposes. Set up as an electronic crystal ball that is suppose to predict threats, DARPA now has a Quantitative Crisis Response program to counter “phony news” and social media to create “national security and military success around the globe.”

Cyber Warfare

The online world of computer networks, commonly referred to as cyberspace, was relegated to the military’s U.S. Cyber Command (CYBERCOM) by 2009.(7) It’s no secret that computers can cause havoc and damage or destroy physical objects by infiltrating them from afar because the material world operates through cyber space (“The internet of things”). In 2012, The New York Times reported that the centrifuges at Iran’s civilian nuclear power plant in Nantz were attacked with the Stuxnet virus in a joint U.S./Israel project.(8)

Carter is reported to be so invested in cyber warfare that he wants to raise CYBERCOM to a full command, equal to the other U.S. military control units that the entire earth’s surface is divided into. In April of this year, he announced that Cyber Command played a role in U.S. attacks on the ISIL-controlled Iraq city of Mosul by “disrupting ISIL’s communications, command and control capabilities.”(9)

In another thrust to encourage techy warfare, the Pentagon established the Defense Innovation Unit Experimental (DIUX) in Silicon Valley and is in the process of establishing another unit in Boston to fund research and development at “non-commercial companies with emerging commercially based technologies that meet our military’s needs,”(10) further establishing the privatized character of new weapons development. When the World Affairs Council, which “prides itself on unfettered access to the city’s diplomatic core” awarded the Secretary of Defense its 2016 International Public Service Award, was it an “aspirational” award as the Nobel Peace Prize was for President Obama?(11)



*The Warrior Web Suit equipped with flexible cables and small motors.
Photo: DARPA*

Super Soldiers

From Boston to Austin, Carter is on the move doling out \$72 billion, with the possibility of more to come, in funding for cutting edge R&D. These projects include the creation of Advance Functional Fabrics of America Institute, a collaborative effort to develop advanced fibers and fabrics, headquartered at MIT in Cambridge. The material being developed is reported to have amazingly lively attributes—it will be able to “see, hear, sense, communicate, store energy, change color and regulate temperature.”(12) Will the cloth be made into uniforms that have more to do than the soldiers who wear them? And while we’re on the subject of new fabric possibilities, we should not forget the importance of accessories. MIT, together with avant-garde Italy—specifically the University of Turin—has developed “a light weight, flexible glove” that “can be carried easily (in a pocket for instance).” It’s called Gold Finger and is made of nylon fabric enhanced with metallic wires to create electrical charges that the wearer can use to cause images to move on a screen without ever touching it.(13)

Wearables for the well-appointed soldier lead into full exoskeletons, or robotic armor officially referred to as the Tactical Assault Light Operator Suit (TALOS) or the Iron Man suit. Such a suit is designed to enhance a soldier’s performance by sensing the environment, warding off injury, and enabling a soldier to carry heavy loads for long distances. Military researchers and defense contractors have been working on this for years, but as yet no one has been able to devise a suit that’s fully functional for U.S. Special Forces which is overseeing development. Another iteration of the suit, still under development, is the Warrior Web suit that is equipped with flexible cables and small motors.(14)

Even more disturbing is what was discussed during a segment of the Defense One Conference in Washington, D.C., in June, featuring neuroscientists from military and university labs and private companies. Neurotechnology, a field that combines the brain and nervous systems with technology, is of particular interest to those who want to see a more efficient “warfighter.” A former project neurologist from DARPA (the Defense Advanced Research Project Agency, the DOD’s incubator of experiments) who now works for a private defense training company, explained that she studied expert marksmen using deadly force weapons to observe how shooters’ brains function so the results can be applied to better train the “warfighter.” Another neuroscientist, from Johns Hopkins Department of Neurology, reported stimulating subjects’ brains with electrodes to see if there was any improvement in cognitive processes. He mentioned that he had received backlash for using healthy, young subjects who experienced some forgetting as a result of the experiments. Critics may have thought it reminiscent of MK-ULTRA, the CIA mind-control program.(15)

Cyborgs

Experiments with performance enhancement move from externally worn items into internal implants with attempts to create cyborgs, the melding of biological humans

with machines, making the “warfighter” into the kind of super-charged character found in gaming, graphic novels, and action movies.(16) In the article, “Mind Field,” which appeared in the September/October 2015 issue of Foreign Policy, writer Tim Requarth, reported that DARPA has invested heavily in brain technologies and in 2014 started developing implants. The possibility arises that soldiers could be directed through brain tissue, and “merging brain signals from two or more people could create the ultimate superwarrior.” Ethicists are concerned that because neurotechnology belongs to an emerging field and is classified as electronic, it’s possible to evade international treaties such as the UN Biological and Chemical Weapons Treaties that could restrict use.(17)

Researchers working in neurotechnology for the military often bring up the value of such research for protecting soldiers on the battlefield or helping veterans with injuries such as PTSD or loss of limbs. Research conducted for the military has, in fact, resulted in such advances, but it takes public money away from purely medical research that could achieve these results. R&D that finds a way to help soldiers should not obfuscate the fact that the Pentagon is involved in destroying life. Soldiers would not be injured emotionally or physically if they weren’t placed in the battlefield in the first place. An ultimate goal in creating Super Soldiers and cyborgs is to improve the ability to hunt and kill humans designated as enemies. As of March 2016, CNN reported that DARPA is continuing its quest to “open the channel between the human brain and modern electronics.”



*The Sea Hunter, the ghost ship that sails without a crew.
Photo: DARPA*

Non-human Warfighters

As a further development, automation is taking over the role of the soldier, sailor, or pilot—even the role of the remote-control operator. The most recent models of military vehicles function autonomously without a human involved to steer. A darling of DARPA is the ghost ship—a submarine seeker called the Sea Hunter designed to track submarines but sail with no crew or even humans operating it by remote control. It embarked on a test voyage from Portland, Oregon arriving in San Diego in early May. Deputy U.S. Defense Secretary Robert Work said that he “would

like to see unmanned flotillas operating in the western Pacific and the Persian Gulf within five years” and that there is a possibility weapons could eventually be mounted on them. The prototype is suppose to cruise for two years at a cost of \$15,000 to \$20,000 per day, which is considered inexpensive contrasted with ships with crews.(18)

Other unmanned aerial vehicles (drones) resemble insects like roaches and dragonflies. “Gremlins” is a program that expels a herd of small drones that leave a mothership in a swarm.(19) All can be equipped for spying or be weaponized.

Work is being done on artificial intelligence beyond that which enables self-driving vehicles and autonomous robotic creatures. Nick Bostrom of the Future of Humanity Institute at Oxford University, expresses concern about the potential to destroy all of humanity.(20)

Hypersonics and Advance Propulsion

Engineers working on hypersonics obviously have no interest in hearing Mahatma Gandhi’s admonition: “There is more to life than increasing speed.” This spring The Washington Post reported that Lockheed Martin is working with DARPA at the latter’s aptly named and “notoriously secretive” Skunk Works division to create an unmanned aircraft that would fly “so fast an adversary would have no time to react or hide.” Work on the super fast plane has been crawling along at a snail’s pace for years, but an aerospace analyst says that when it eventually does fly the real problem is that, combined with hypersonic missiles, it would give foreign governments so little time to respond that they could overreact and increase the risk of global annihilation.(21) Engineers are also looking at ways to send a plane farther with a great boost that allows it to glide through the air with minimal detection.

Directed Energy or Electromagnetic Weapons

The Department of Defense Dictionary of Military and Associated Terms defines directed energy as “an umbrella term covering technologies that relate to the production of a beam of concentrated electromagnetic energy or atomic or subatomic particles. A directed energy weapon or system is one that uses directed energy to incapacitate, damage, or destroy enemy equipment, facilities and/or personnel.”(22) The DOD is encouraging R&D on these types of weapons which include high-energy lasers, high-power microwaves, and radio frequency technologies.(23)

Investigative reporter Dahr Jamail reports that the U.S. Navy has secretly been conducting electromagnetic warfare testing and training on Washington’s Olympic Peninsula. This was unknown to area residents and visitors, as was the fact that the Navy planned to set up towers in the Olympic National Forest emitting electronic radiation signals involving planes in the air and ships at sea, until FOIA documents were obtained in 2014 creating public outcry.(24)

Environmental Modification Techniques (ENMOD)

The High Frequency Active Auroral Research Program (HAARP), which consists of an environmental modification technique making use of electromagnetic weapons, was developed as part of an Anglo-American partnership between Raytheon Corporation, which owns the HAARP patents, the U.S. Air Force and British Aerospace Systems (BAES). The experimental program was based in Gakona, Alaska from 1992 and shut down in 2013, but the ability on the part of the military to modify weather and trigger major catastrophes on earth like hurricanes and earthquakes continues to exist. Too few voices have been raised about the danger, but Michel Chossudovsky of Global Research, Canada, has written meticulously researched articles about it for several years.(25)

In the End—and the Beginning

This article doesn't begin to scratch the surface of experimental weapons. It's also very concerning that there are undoubtedly many things kept secret from us that should not be. But some vigilant and dedicated people have been able to uncover what is going on and push back as they have, for example in the Pacific Northwest. In other instances around the country, grassroots activists have revealed glaring holes in security for nuclear power plants and weapons facilities, water systems, and other infrastructure. Realistically, we do need to protect the nation's infrastructure from acts of humankind or nature.

Instead of seeking more effective ways to carry out offensive actions against foreign lands, causing enormous suffering abroad and endangering our own health and well being in the process, the Defense Department and its techy partners could be funneling efforts into improving infrastructure protection. Using robotics to safely destroy land mines and the unexploded U.S. ordinance left by the military in other countries would be another peaceful use for the DOD.

On a purely pragmatic level, the development of sophisticated, new weapons can only come back to haunt us because foreign powers possess innovative technology, too.

This means that only cooperation among all of our neighbors on the planet can save us. Jeannette Rankin, who as the first U.S. Congresswoman voted against U.S. entry into WWI, and was the only member of Congress to vote against U.S. entry into WWII said: "You can no more win a war than you can win an earthquake."

We can't win at war so we'd better begin to win at peace.



Congresswoman Jeannette Rankin who had the courage to vote against the U.S. entry into WWI and WWII.

Photo: Associated Press

Mary Beaudoin is the editor of the Women Against Military Madness Newsletter, and a member of the WAMM End War Committee. Bob Jones contributed information to this article.

1. "What Happened when Ash Carter Crashed Davos." Bacon, Kevin, Defense One. January 27, 2016. <http://tinyurl.com/jzecz4b>
2. "Pentagon to Establish Defense Advisory Board." Department of Defense. News. <http://tinyurl.com/hgvzsgf>
3. Carter announcement at Defense One Tech Summit webinar, June 10, 2016.
4. Department of Defense. News transcript. Remarks by Secretary Carter and Facebook COO Sheryl Sandberg. <http://tinyurl.com/qhhblwd>. Sandberg wrote the best-selling Lean Forward and is working with the Pentagon to support women in military careers.
5. Defense One Tech Summit webinar. Sponsored by Booz Allen Hamilton. Washington, D.C. June 10, 2016.
6. Ibid. Endnote no. 5
7. The Department of Defense Cyber Strategy <http://tinyurl.com/qx75gm5>

8. "Obama order sped up cyberattacks against Iran." Sanger, David. June 12, 2012. The New York Times. <http://tinyurl.com/d4tjk6j>
9. "Carter May Elevate CYBERCOM to a Full Combatant Command." Tucker, Patrick. Defense One. April 5, 2016
10. "Carter Announces Version 2.0 of Defense Innovation Unit Experimental" Garamone, Jim. Department of Defense. News. May 11, 2016. <http://tinyurl.com/h4gnwta>
11. "Spanning the Globe: World Affairs Council-DC Prides Itself as Place 'Where Learning Happens'." Luxner, Larry. The Washington Diplomat. March 2015
12. "New Institute Will Accelerate Innovation in Fibers and Fabrics." Chandler, David L., MIT News, April 1, 2016
13. "Magic Maestro." Sightlines. Foreign Policy magazine. March/April 2016.
14. "Can we build an 'Iron Man' suit that gives soldiers a robotic boost?" Cornwall, Warren. Science. Oct. 15, 2015
15. The Search for the Manchurian Candidate: The CIA and Mind Control, The Secret History of Behavioral Sciences. Marks, John. Times Books, 1979
- "The Mind Field." Requarth, Tim. FP Magazine, Sept./Oct. 2015. pp.52-59
16. It should be noted that: A handful of performance artists and other adventurous people have, of their own volition, had inserts surgically embedded into their bodies for non-military purposes to stimulate extraordinary experiences. Long-term effects are yet known. Body Hacking Conference 2017. <http://tinyurl.com/h2dncvy>
17. "The Mind Field." Requarth, Tim. FP Magazine, Sept./Oct. 2015. pp.52-59
18. "U.S. military christens self-driving 'Sea Hunter' war ship." Reuters. April 8, 2016; "Navy's Unmanned Sea Hunter Arrives in San Diego." U.S. Naval Institute News. May 4, 2016. <http://tinyurl.com/htts8pr>
19. "Secret Most Advance US Robots Army – Trillion Dollars Defense." Education Documentary. Al Jazeera. March 13, 2016. <http://tinyurl.com/jhdelb4>
20. The Future of Humanity Institute. <http://tinyurl.com/zxbg006>
21. "Lockhead Martin joins race to build hypersonic aircraft." Davenport, Christian. The Washington Post. March 28, 2016; Defense One
22. Department of Defense Dictionary of Military and Associated Terms. Joint Publication 1-02 <http://tinyurl.com/hsoextj>
23. "Directed Energy Weapons: Promise and Prospects." Ellis, Jason D. Center for New American Security. 20YY Series. April 2015
24. "Exclusive: Navy Secretly Conducting Electromagnetic Warfare Training on Washington Roads." Jamail, Dahr. March 16, 2016. Truthout. <http://tinyurl.com/z6bv84v>
25. Centre for Global Research, Canada globalresearch.ca