



DEFENSE TECHNOLOGY MONITOR

The American Foreign Policy Council's Review of
Developments in Defense Technology

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May 13, 2018 **Richard M. Harrison**

Related Categories: Cybersecurity and Cyberwarfare; Military Innovation

SLOWING SOLDIERS' BIOLOGICAL CLOCKS

The Defense Advanced Research Project Agency (DARPA) is looking to nature to save lives on the battlefield. In order to provide more time for warfighters to get adequate treatment for combat injuries, DARPA's new biostasis program is attempting to slow down body processes to a crawl, similar to how wood frogs survive frozen environments by halting activity all the way down to the cellular level. Ostensibly, if scientists are able to suspend biological processes, soldiers with severe injuries can be transported to proper medical facilities before wounds are fatal. If successful, this technique would be equally valuable in civilian life, but the technology is still in its infancy. (*Engadget*, March 4, 2018)

HOW 3D PRINTERS ARE INCREASING EFFICIENCY IN WEAPONS PRODUCTION

Australia's Defense Ministry is attempting to combine the explosive power of "energetic materials" and 3D printers to increase efficiency and reduce the costs of weapon production. The Defence Science and Technology Group (DST Group), an R&D organization in the Australian government, is working with industry to create additive manufacturing technology that uses energetic materials (polymers for use in rocket fuel or explosives with high yield detonations) as part of advanced weapon system development. The rapid production of the highly explosive material could lead to significant innovations in weapon systems. (3D Printing Industry, March 5, 2018)

NEEDED: PRIVATE SECTOR HELP ON AI

As America's adversaries accelerate their efforts to develop artificial intelligence (AI), the U.S. is in growing danger of falling behind in the field - a dynamic that could have game-changing consequences on the modern battlefield. The potential gap is exacerbated by social dynamics within the United States; although the country has a deep talent pool in this sphere of technology, top-level talent is concentrated in Silicon Valley, while significant mistrust of cooperation between the public and private sectors persists in the "post-Snowden era."

To correct this deficiency, former Deputy Secretary of Defense Robert O. Work and Carnegie Mellon Computer Science Dean Andrew More have launched a task force, dubbed "Project Maven," to foster public/private collaboration in the AI sphere. The group, still in formation, will be made up of industry leaders willing to work with the U.S. government to ensure the country remains ahead of the curve in the technological domain. The time is now to ensure the U.S. doesn't fall behind, Work has stated. "This is a Sputnik moment." (*New York Times*, March 15, 2018)

CHINA CONSTRUCTS HYPERSONIC TESTING FACILITY

China is one of several nations now developing hypersonic weapons capable of evading traditional anti-missile systems, and Beijing is working hard to take the lead in this field. Chinese authorities are now in the process of developing a one of a kind test structure for hypersonic craft - including missiles. The hypersonic wind tunnel under development measures almost 900 feet in length, and will allow for hypersonic flight-testing beginning in 2020. The tunnel may provide the PRC with an advantage of being able to test new large-scale missile designs in a near real world environment, without showcasing the missiles with live flight tests that allow adversaries to measure progress. (*Science Alert*, March 22, 2018)

LOUD, NON-LETHAL LASERS

For decades, the U.S. military has focused on using lasers for targeting and shooting down missiles and drones. However, research is also underway to utilize lasers for non-lethal purposes. The DoD's Joint Non-Lethal Weapons Program (JNLWD) is developing a dual laser system to project sounds, light, or heat toward an adversary for the purposes of intimidation or to impede the enemy's progress. The concept involves one ultra-fast laser firing across distances toward an adversary, while a second beam fires a shot that alters the newly created plasma field created by the first, thereby producing disruptive sound or light. The weapon is effective in causing enemy confusion, because it creates the appearance of sounds or voices coming out of nowhere. (*Interesting Engineering*, March 23, 2018)