

FUTUREtakes

Transcultural Futurist Magazine

ISSN 1554-7744

Vol. 3, no. 4 (Winter 2004-2005)

Next Time, the Planes Might Not Need Pilots ...

Emerging Weapon of Mass Destruction Technologies: Impact on US Security

Synopsis of the September 2004 WFS Washington DC Chapter dinner program presented by Forrest Waller; summarized by Dave Stein [Note: Since FUTUREtakes does not wish to publish information that can be used for malevolent purposes, certain details are omitted from this summary.]

The September 2004 program, presented by Forrest Waller, focused on emerging technology developments that have the potential to create “new kinds” of weapons of mass destruction (WMD) as well as disruptive military technologies. Mr. Waller explained upcoming changes in information technologies, biological technologies, nanoscale technologies, and advanced energy sources and materials. In each of these areas, he finds the potential for improved WMD and/or enablers of new WMDs. Assuring the attendees that his objective was not to sound like a Luddite, Mr. Waller emphasized that scientific research can create WMD by accident as well as by design.

THE METHODOLOGY

The presentation was based largely on a study that consisted of a survey of technical data that might enable new kinds of WMD and/or disruptive military technology, followed by an assessment of the possible impacts on national security. The research also included technology forecasts, at least one of which had a business orientation, as well as interviews of subject matter experts with particular attention to their points of consensus. Because of their role in recommending financial investments, even senior economists in financial institutions were interviewed. One challenge in the study was distinguishing between science fact and science fiction – a distinction that is sometimes blurred.

THE TECHNOLOGIES AND THEIR POTENTIAL IMPACTS

Four major technology areas were identified in the study – information technology (IT), biotechnology including genome-based technology, micro- and nanotechnology, and advanced energy sources. Mr. Waller discussed possible malevolent as well as benign applications of these technologies, singly as well as in combination. For example, biotechnology offers the promise of replacement organs, improved immunity, and perhaps someday even human-directed evolution. However, as Mr. Waller was quick to point out, this same technology that does good things can be harnessed to do bad things, such as

create new diseases and disorders that target humans, animals, or crops. For all of their promise of abundant, cheap energy, the advanced energy sources can also be perverted for destructive use.

In the case of IT, Mr. Waller noted some differences. For example, IT can connect with a large number of people and can be a WMD enabler, but its effects are primarily disruptive and do not normally result in mega-deaths or major property damage. While cyber attacks against utilities, telecommunication systems, transportation systems, and financial networks can be massively disruptive, mass casualties would have a low likelihood. Even so, such disruption would undermine a nation's economic prosperity and public confidence in the government's ability to ensure safety and security. In the out years, however, IT (with AI) can conceivably create smart robots that can cause death and destruction on a wider scale.

OUTLOOK – “GOOD GUYS” VS. “BAD GUYS”

Mr. Waller noted several challenges that lay ahead. He envisions that at least the technology for powerful new WMD and disruptive technologies are likely to appear, and some technologies may first appear in other parts of the world. This is because the competition is keen. The R&D in these four technologies is being conducted in several countries, and there is no guarantee that the next breakthrough will be by “good guys.” To compound the problem (from the US standpoint), the US educates much of its competition, and policy decisions that limit research or research funding (e.g., for stem cell research) also have their impacts. A related concern is whether all countries that deploy these technologies will rely on a human-in-the-loop to make life-and-death decisions in combat or whether some will relegate such decisions to AI.

A second challenge is that some new technologies and developments are not covered by international law or other existing proliferation constraints, especially in the cases of innovations that cannot readily be characterized as pathogens, chemicals, or fissile materials.

Then there is the challenge of defining WMD, since as Mr. Waller pointed out, recent events demonstrate inconsistencies. The present definition includes weapons that are not massively destructive while also excluding other weapons that are. For example, the 9/11 terrorist attacks resulted in just under 2,900 deaths at New York City's World Trade Center, but they did not result in the megadeaths that are commonly associated with WMD. The post-9/11 anthrax attacks, while massively disruptive, resulted in few deaths, and yet anthrax is considered a WMD. Conversely, the car bomb used against the Murrah Building in Oklahoma City resulted in 286 deaths and substantial damage, and yet a car bomb is not normally regarded as a WMD. According to Mr. Waller, redefinition of “WMD” will raise fundamental national security policy issues for the US as well as for the international community.

A fourth challenge is international political control. Mr. Waller sees greater control over the most promising new technologies as inevitable. For example, a European Parliament committee recommends banning electromagnetic weapons as well as any weapons that create superfluous injury or unnecessary suffering. Various non-governmental organizations (NGOs) want political control over weapons that can destroy the environment, especially “leave behind” weapons such as land mines, which generally outlive the hostilities that placed them. For their part, genetically altered materials present their own legal challenges. Yet, the study uncovered recurrent and in some cases contradictory themes regarding political control – that it is undesired, unacceptable, ineffective, unneeded, or too late.

Still another challenge is the scientific controversy on the various technologies and the possibility of exaggerated claims, particularly regarding how achievable they are and how effective they will be.

Finally, it was noted that while the technology revolutions will improve military capabilities in key mission areas, new kinds of WMD and disruptive technologies can negate security expectations. In addition, they create new challenges in surveillance, warning, and damage assessment.

AFTER THE PROGRAM

As the attendees said their good-byes and began their treks home, perhaps at least some of them were thankful for what we don't have yet – futurists though they may be!