

Warfare in the 21st Century

In early March, I gave a talk on Drone Warfare in Boston. My co-presenter, Subrata Ghoshroy gave a great talk on the latest weapons being developed for '21st century warfare'. He connects the development of specific weapons with the particular wars where they were first used, highlighting the degree of overkill as compared to the resources of the 'enemies' they were used to destroy. Our talks weren't recorded, but I did get a copy of Subrata's power point, and he agree to share on this blog.

The New World Order and Warfare in the 21st Century

*Guest Post by Subrata Ghoshroy
of Boston, Massachusetts*

As the curtain came down on the twentieth century, there was a sense of great optimism that the new century would bring peace and security in the world since the Cold War was over.

A decade on, the hopes for a new millennium of peace and prosperity have begun to fade. The first decade has already witnessed unleashing of an unprecedented military might on defenseless people in countries like the former Yugoslavia, Iraq, Afghanistan, and Libya. Hundreds of thousands civilians have been killed and millions more rendered homeless in these wars. A new kind of war is being waged with unmanned aircraft called drones with names such as Predator or Reaper, which can attack a target with hellish Hellfire missiles. The "pilots," who don't fly, pull the trigger sitting in the comfort of air-conditioned command posts thousands of miles away.

Instead of the much heralded "peace dividend," military spending worldwide continued to rise and crossed the hitherto inconceivable trillion-dollar mark with the U.S. accounting

for more than half. Yet, we cannot find adequate sums to fund research to address climate change, for example.

A large amount of the defense budget focuses on the research and development of new weapons. The close collaboration between our research universities and the military continues unabated a quarter century after the end of the Cold war. New developments in science and technology fuels the military's desire for evermore sophisticated weapons that have enormous destructive power.

In the following presentation, I outline the history of some major weapon systems over the last 25 years and how they are evolving today with the emphasis on offensive cyber and space weapons that threaten global peace and security.



Click on the image on the left to download the pdf of Subrata's presentation.

Below are some notes that go with particular slides/pages of the presentation:

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In my talk, I would like to discuss the emergence of the U.S. as what I would like to call it – a “hyper power”, a phrase that was to my knowledge first used by the French Foreign Minister Dominique de Villepin before the invasion of Iraq in 2003, which France opposed. I would like to argue that the U.S. technological superiority in the absence of a counter-balancing force like the former USSR provides it with an

unparalleled opportunity to pursue its “national security” interests unchallenged. The new wars envisioned by the U.S. military will be based on what it called a “Revolution in Military Affairs.” They will be fought with the outer space as an integral part, cyber weapons, precision guided missiles, and autonomous systems, commonly known as drones. I will argue further that this strategy is not working as witnessed in the invasions of Afghanistan, Iraq, and Libya. The U.S. public is also turning against foreign interventions.

pg 3:

In the immediate aftermath of the collapse of the Soviet Union in 1991, the world faced a power vacuum. The U.S. took advantage of this situation and elected to start acting as the world policeman. It attacked Panama in 1989 and Iraq in 1991 to eject Saddam Hussein from Kuwait. The sudden collapse resulted in a pell-mell rush to abandon the old system across eastern Europe and especially the Baltic states. While the transition was mostly bloodless, the exception was the former state of Yugoslavia. It experienced brutal ethnic wars between Serbs, Croats, and the Muslim majority in Bosnia and Kosovo. The ensuing humanitarian disaster gave the US and by extension the NATO license to take unilateral actions in Kosovo circumventing the UN.

A new theory of interventions was invented called the “Right to Protect” which was advocated by the U.S. and Britain. Despite the disappearance of the USSR, which was a so-called “peer competitor” primarily in the context of military capability, the U.S. military spending remained at the Cold War levels. Instead of the dissolution of NATO, it expanded quickly eastward including the erstwhile eastern block states that formed the former Warsaw Pact, which was disbanded a few months before the formal the end of the USSR. Along with continuation of massive overall military spending, the U.S. maintained within the military budget the Cold War paradigm of a huge weapons R&D to create evermore sophisticated hi-tech

weapons for the future wars.

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In the wake of the demise of the USSR quick victories in the military operations in Panama, and especially the Gulf War against the Iraqi Army under Saddam Hussein, gave the U.S. military a sense of invincibility based on its overwhelming superiority in both technology and organization. In Panama, it showcased the F-117 stealth fighter, for example, along with the Hellfire missiles the army launched from its Apache helicopters. They were overkill given that Panama's armed forces were equipped with WWII vintage weapons. It didn't have radar systems to track the supersonic U.S. aircraft. There was no need for stealth, but the so-called "Powell doctrine" called for overwhelming force.

Colin Powell was the Chairman of the Joint Chiefs during the invasions of Panama in 1989 and also Iraq in 1991. As may be seen in the list above, between the fall of the Berlin Wall in 1989 and the September 11 extremist attacks on the U.S. soil in 2001, the U.S. and NATO carried out several military interventions that witnessed the debut of new weapons each time in a battlefield. For example, in Panama it was the F-117A Stealth fighter and the AH-64 Apache helicopter, which has become the staple in U.S. operations all over the world.

GPS-guided Tomahawk cruise missile was introduced during the Gulf War in 1991. It has been heavily used ever since in all US military actions. One of the significant changes in the technology of war fighting was the integration for the first time of space assets, including real-time satellite communications and imagery, which was introduced in the Gulf War. Another was the pilotless aircraft called Predator, which came to be known as "drones" that were first deployed during the Kosovo campaign. Other such aircraft have been developed and are now routinely deployed.

pg 8:

U.S. led military interventions continued throughout the first decade of the 21st century following the extremist attacks on U.S. soil on September 11, 2001 eight months after George W. Bush took over as the President. The horrific attacks in New York and Washington gave the neocon Bush team led by the Vice President Dick Cheney and the Secretary of Defense Donald Rumsfeld a free hand in conducting a new war, which they called the "Global War on Terrorism." U.S. declared a war without end on the Muslim world, which continues to this day with disastrous results not only for the people of those countries that US and its allies invaded, but also for the American people. To start this open-ended war, it first invaded Afghanistan to eliminate Al Qaeda and its leader Osama Bin Laden, who was an US ally during the fight against the Soviet intervention in that country.

Massive new ordnance called the bunker buster was dropped to destroy the Taliban hideouts in the mountains, which the CIA had helped to build to fight the Soviet army. The intervention in Afghanistan was carried out with the approval of the UN Security Council, which responded to the brazen attacks on US cities. Afghanistan also saw for the first time large-scale use of the drones. While they were deployed in a limited way by Bush, Obama expanded their mission significantly. Drone attacks caused large civilian casualties, which the US disputed mainly because the attacks were made secretly by the CIA with little public accountability. In the meantime, the neocons openly advocated a reshaping of the Middle East by targeting countries that it saw as inimical to US interests in the region. These countries that it labeled as the "Axis of Evil" were Iraq, Iran, Syria, and Libya.

Tying Saddam Hussein to the attacks on September 11 without any evidence, in 2003, it attacked Iraq and overthrew him quickly. The U.S. sought a UN Security Council resolution authorizing its action presenting false evidence to the UN about Iraq's possession of weapons of mass destruction. The

French vetoed the resolution, but U.S. went ahead with the attack putting together a coalition of a number of small countries with the exception of the United Kingdom. It unleashed what was described by Donald Rumsfeld as the “shock and awe” that reduced large areas of Iraq into rubble and killed hundreds of thousands of citizens.

Apart from the use of all the new weapons like F-117A fighters, JDAM bombs, Tomahawks, and drones other hitherto untested weapons were also reportedly deployed to do live fire test that shut down Iraq’s power grid temporarily, for example. A similar, albeit smaller, campaign was launched some years later in Libya to topple Muammar Kaddafi, who was captured and murdered brutally by the “rebels” who took over power in Libya. NATO continues to threaten the Syrian government with military strikes to overthrow President Bashar Al Assad. Syria was forced to give up its chemical weapons, while nothing is said about nuclear weapons in Israel.

pg 9:

Here is how Tomahawk manufacturer Raytheon brags about the missile:

The Tomahawk is a highly accurate, GPS enabled precision weapon. The latest variant (Tomahawk Block IV) includes a two-way satellite data-link that enables the missile to be retargeted in flight to preprogrammed, alternate targets.

During the NATO-led effort against the regime of Libyan leader Muammar Gadhafi in 2011, Tomahawk played an instrumental role in the operation. One submarine fired more than 90 missiles at a variety of targets, and the USS Barry fired the 2,000th Tomahawk in combat. In 2013, Raytheon delivered the 3000th Tomahawk Block IV missile to the U.S. Navy.

A Tomahawk missile costs about \$1 million. Raytheon has already made \$3 billion in selling 3000 of them to the U.S. Navy alone.

pg 14:

The Predator “drone” has become the weapon of choice for unmanned aerial missions in what the U.S. calls “counter terrorism operations.” It is made by the General Atomic Corporation and has a price tag of \$17-million. Press reports indicate that the Predators will be replaced by another drone called the Reaper, also made by General Atomic. Called a “hunter-killer”, it is bigger than Predator and can detect and kill humans by firing Hellfire missiles. Predator flies at an altitude of 25,000 ft. and the Reaper 50,000 ft.

Another drone is known as the Global Hawk, which is the largest flying unmanned aircraft. It is 44 ft. long and has a wingspan of 116 ft. Global Hawk is made by Northrop Grumman Corporation and costs \$223 million. It can loiter at altitudes of 60,000 ft. for up to 48 hours providing intelligence to its remote operators.

pg 15:

Another staple of US arsenal is the Hellfire missiles which can be fired from Apache helicopters and Predator drones, for instance.

The military is developing a new missile called Joint Air-to-Ground Missile (JAGM) to replace all Hellfire missiles. But the program has run into major problems. Raytheon, the manufacturer of Hellfire missiles, is trying to improve its guidance and targeting systems.

pg 16:

The U.S. military uses drones widely in Pakistan. Iraq, Afghanistan, and Yemen in mostly secret missions for targeted killings. The President himself approves the kill list and the State Department advances contorted legal thesis about their legality. Even the establishment mouthpiece the New York Times criticized the “thin rationale” for drone killings. The U.S. government refused to acknowledge that it was carrying out drone strikes in many places until a popular outcry forced it

do so. However, it provides little information about the damage and casualties from such attacks. Using such language as "collateral damage" for civilian casualties, the US military emphasizes the their strikes as pin-pointed with little unintended consequences. However, anti-drone activists and human rights organizations have documented the mounting death toll and damage to poor communities where strikes take place.

pg 22:

According to a report by the Congressional Research Service, conventional Prompt Global Strike (CPGS) weapons would allow the United States to strike targets anywhere on Earth in as little as an hour permitting the U.S. to attack high-value targets or "fleeting targets."

As the name implies, the new missile will carry a conventional payload and will be able to hit any target around the world within an hour or so traveling at hypersonic speeds (Mach 5 or more). The project was originally conceived under the Bush administration as an option to save the nuclear-tipped Trident missiles by converting them to carry conventional weapons. The Obama administration has eagerly embraced it because the US military believes that this will allow them to have a non-nuclear option that will deter evolving threat countries or even non-state actors from attacking the US and its allies. Russia and China have both reacted sharply because of the risk of mistaking a CPGS attack for a nuclear first strike.

The U.S. military is considering a number of systems that might provide it with long-range strike capabilities. For example, The Air Force and Navy have both considered deploying conventional warheads on their long range ballistic missiles. The Navy sought to deploy conventional warheads on a small number of Trident II submarine-launched ballistic missiles. The Air Force and the Defense Advanced Research Projects Agency (DARPA) are developing a hypersonic glide delivery vehicle that could deploy on a modified Peacekeeper land-based

ballistic missile—a system known as the conventional strike missile (CSM), the report states.

pg 23:

With the increasing use of outer space as an integrated part of U.S. war fighting along with widespread use of computers in command, control, and communications, the domains of cyberspace and outer space have become very closely intertwined. For example, satellite links are key to the missions of the armed drones. Vast amounts of satellite-based geospatial imagery, intelligence data and military communications travel over satellite links. Military computer networks use secured satellite links and the U.S. military increasingly buys commercial satellite links for its own purposes because of a shortage of bandwidth in military satellites.

Although the U.S. holds a huge technical edge over its adversaries because of its dominance in space and computer networking, yet it is proving to be one of the areas of serious vulnerability. Many other countries want to challenge the US hegemony by developing their own defensive and offensive capabilities, especially in the cyberspace. In response, the U.S. military under its Strategic Command (STRATCOM) has already set up a cyber command called USCYBERCOM with a mission to carry out what it calls “full spectrum military cyberspace operations.” It includes cyber commands in each of the services – Army, Navy, Air Force, and the Marine Corps.

It has come to light that the U.S. has already undertaken offensive cyber operations against some countries. What came to be known as a joint Israeli-US operation, a malware called Flame was first introduced into the Iranian nuclear computer network, which collected broad intelligence information on the system. It then enabled offensive operations against the centrifuges in the uranium enrichment facility creating havoc. The offensive actions were reportedly carried out by another

virus called the Stuxnet.

pg 24:

The figure reproduced from the manual shows cyber electromagnetic activities (CEMA) operational view spanning over all the domains

pg 25:

The Army issued in February 2014, a Field Manual (FM 3-38) for its soldiers for cyber and electromagnetic activities (CEMA). It is the first doctrinal field manual of its kind. The purpose of FM 3-38 is to provide an overview of principles, tactics, and procedures on Army integration of CEMA as part of land operations. It provides tactics and procedures for both electronic warfare and cyber operations. It clearly shows that one of its activities is to attack enemy systems.

pg 26:

According to the US Department of State, the Asia-Pacific region accounts for the following:

- Nearly a third of the Earth's population and a huge proportion of biodiversity vulnerable to climate change;
- Over one-quarter of global GDP;
- Twenty-six per cent of U.S. exports, including over 40 per cent of U.S. agricultural exports – in all, some \$1.2 trillion in two-way trade with the United States.

Recognizing that America's future prosperity and security are intertwined with the East Asia-Pacific region, President Obama made a strategic commitment to rebalance U.S. efforts and investments toward Asia. The United States will remain a strong, reliable, and active partner in the region and is investing diplomatic, public diplomacy, military, and assistance resources in a way that is commensurate with our comprehensive engagement. We continue to emphasize economic development, energy cooperation, people-to-people exchanges,

youth, and education in our programs.

Obama was interested in disengaging from wars in Iraq and Afghanistan that Bush has started, which proved to be disastrous. At the same time, the US is concerned about China's rise. So, behind the soothing words is a newly revived policy to contain China although forcefully denied by government officials at all levels. In reality, there are two major components in this policy. One is military and the other is trade. It contemplated shifting of a majority of its naval assets from the Middle East to the Pacific region. The U.S. is aggressively renewing its old, but often frayed, ties with countries like Vietnam and the Philippines taking advantage of their recent conflict with China. According to the State Department, security cooperation is an essential part of the rebalance to Asia, where U.S. economic, diplomatic, cultural, and military ties continue to strengthen daily. In the past year, the State Department has approved and reported to Congress over \$20 billion in arms sales to countries across the Asia-Pacific region.

The economic centerpiece is the Transpacific Trade Partnership (TPP), which is a controversial free-trade agreement similar to NAFTA that the U.S. has been pushing hard to foster, in its own words, "economic recovery through increased exports and jobs. While its members include Japan, Singapore, and Vietnam, China is conspicuously absent.

A new dimension to this pivot is the intense courting of India as a strategic partner. The relationship has not grown as much as the US would have liked. However, India continues to expand its military capabilities and has conducted numerous military exercises jointly with the U.S. armed forces. It has also made little efforts to reach out to China even though bilateral trade between India and China has increased steadily. On the other hand, clearly egged on by the U.S., India is cozying up to Japan's conservative leader Shinzo Abe in forming an Indo-Japan strategic alliance, which is bound to irk Beijing.

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In the wake of the overwhelming victory of coalition forces in Operation Desert Storm, a good deal of discussion took place whether the world had witnessed a Revolution in Military Affairs (RMA). Fueled by hype and publicity by large U.S. defense contractors, who jumped at the possibility of making huge profits from more expensive hitech weapons, Washington was awash in the mid-1990's with the talk of an RMA. In Congressional hearings, seminars, and in an outpouring of publications, the military sang the virtues of fighting a war without large American casualties

As fast as it developed, the term disappeared as quickly after the invasions of Afghanistan in 2001 and then Iraq in 2003. In both countries, the US military met an insurgency that employed traditional guerrilla tactics with low cost weapons like landmines, which the US military calls Improvised Explosive Devices (IED) and, rocket propelled grenades. Both Taliban and the Sunni militants repeatedly employed suicide bombers to attack NATO forces.

Despite huge spending and involvement of tens of thousands of US soldiers, both countries remain in complete chaos. Several thousand NATO soldiers lost their lives in battles with militants. Hundreds of thousands Iraqis and thousands of Afghans perished, mostly civilians.

In a ten-year period, the U.S. spent over \$1000 billion (\$1 trillion) for the two wars. The real cost is expected to be much higher as thousands of American soldiers, 7-8 times more than those who die in the battlefield, come home. Many of them are severely disabled and many with permanent psychological damage. Economist Joseph Stiglitz has estimated the real cost of the wars to exceed \$3000 billion, a large portion to account for the cost of care of the war veterans. RMA has run its course, at least publicly. Yet a Congressional research report states that the concept of an RMA itself, its constituent elements, and the timing of its occurrence,

however, remain subjects of continuing debate.

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As the financial and human costs of the two wars continued to mount, Americans witnessed a near-collapse of the Wall Street and a great recession that reminded many people of the Great Depression of 1929. The support for wars abroad declined along with a massive loss of confidence in the political system. The popularity of Congress hit an all-time low of 10%. Public opinion polls showed majority supported withdrawal of American troops from Iraq and Afghanistan.

The anti-intervention sentiment became clear during a debate over whether to bomb Syria amid allegations of the use of chemical weapons by the Syrian military. After a vote in the British Parliament when whether to join the U.S., which Prime Minister David Cameron lost, U.S. Congress nervously deferred any voting. In the meantime, President Obama with the help of Russia reached a deal with Syria to avoid unilateral air strikes. Syrians agreed to give up their chemical weapons by joining the Chemical Weapons Convention.

The decision to call off bombing Syria could be a watershed moment in the US foreign policy, although hardly a turning point. It continues with NATO expansion and meddling in Ukraine at Russia's border and imposition of sanctions against Russia. It is also continuing a belligerent policy towards Iran and ratcheted up support for Syrian opposition.

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There are signs that the singular domination of the United States in world affairs is diminishing. The revelations by Edward Snowden of massive spying and eavesdropping by the National Security Agency, which included not only Americans, but also world leaders such as German Chancellor Angela Merkel and Brazil's President Dilma Rousseff, set off an international outcry. Majority of Latin American nations are no longer obedient allies of the US. China is leading efforts

to set up a bank that would compete with the US-led World bank. The BRICS bank will have an initial capitalization of \$100 billion.

The technology of war in the 21st century makes it easier to fight an asymmetric war with the U.S. with cyber attacks and drones. Multiple countries have acquired drone capabilities. Militant groups like the ISIS have posed a huge security challenge.