**Rethinking National Security in an Era of Declining Budgets Seminar Series**

26 June 2012

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*The Future DoD Budget / Trades That Could be Made*

Notes:
Below are informal notes taken by a JHU/APL staff member at the Seminar.

**Context**
The Nation has been at war for years – for the Air Force it has been 20 years with Southern Watch, etc.
- No precedent for this in this country
- Can see the wars winding down now
- Given situations like the Arab Spring, North Korea, etc., it is unlikely that peace will be breaking out all over

There is also a problem of what to call the pivoting or repositioning toward the Pacific
- When you ask the military or the media what is going on in the world, you don’t get to Pacific area concerns for a long time
- Nice to have aspirations about turning toward the Pacific, but that’s all it is

Future threats will be coming from underlying problems like demographics
- Along the equator the percentage of 17-35 year old men is growing
  - Although this is leveling off somewhat now
  - Also an area of tremendous mal-distribution of wealth
    - Many in the area are well-educated but can’t feed their families
    - Makes them willing to take risks – risks Americans might not understand
- Complicated by fact that the average age in the region is less than 20 years old
  - Go to about 20 degrees North and the average age is more like 30-40 years old
    - Will have a different risk equation than those in their 20s
    - Tipping point somewhere in the 30s or so
  - Very different risk calculus between the 2 regions / demographic sets
  - Problems likely to grow out of these demographic concerns
    - US is among the oldest populations – depending on which studies you read
    - Russia will never again have a million man army – at least not a Russian one
  - US does have the advantage of immigrants who are the biggest risk-takers
    - Immigrants are willing to try almost anything to improve lives of their families
- Bottomline: such concerns are not favorable to the prospects for peace

US about at the tipping point – ready to put all this war behind us now
- Must decide what we want to be as a nation / what we want our military to be able to do
- Problem: have never guessed right in the past
- US currently has history’s best trained/equipped counterinsurgency force
  - When troops live in a compound and only go out on patrols, it is an occupation force
    - Is that what we want going forward?
    - Very expensive
    - Has very little other applications – not flexible enough
      - Little mobility, very heavy, not strategic
  - Are those the right attributes?
- Must also decide:
  - What will be the threats of the future?
  - What should we shed?
  - What should we keep?
  - Or do we just decide what we can pay for?
  - Where is our leverage?

Key, unique attribute US has in these conflicts: All-volunteer force
- There was some worry about whether such a force would hold together under the strain
  - Would it be representative enough of the entire country?
  - Would enough of the country “have skin in the game” to continue the support needed?
  - The Reserve and National Guard participation in these wars has covered this aspect
    - Ensured that most Americans were touched by knowing someone at war
- With a conscript force when you go into a cutback mode it is necessarily salami slice action
  - The force gets hollowed out
  - First readiness gets cut
  - Then manpower is cut in the second to fourth years of the cutback
  - But inflation then requires more cuts
  - Then start cutting infrastructure and modernization
- With a volunteer force there is an expectation for the best training, equipment, etc.
  - Without the best, soldiers vote with their feet
  - A hollowed out force is forced into barracks rather than being out in the field
    - Requires an whole different type of leadership
    - As a young Marine captain, found shooting a few rounds at paper targets after being at war not adequately satisfying
- Bottomline: There is a need to think through how the military can handle this austerity situation

Second big trend to consider: Reductions in the force size required to fight wars
- This is generally to the good
- In the World Wars fought as armies – often multiple armies
- From the end of Korea through the first Gulf war fought as divisions
  - Even the Cold War was fought as divisions
  - Lethality and mobility had improved to allow this
- The most recent wars were fought by brigades
  - Permitted by more improvements in lethality, mobility, and technology
  - We may not yet be ready to move lower than this
- What comes next?
  - Probably not going to go much further for the moment in improvements in these areas
  - But can see the lethality and mobility of Seal Team Six
As Vice Chairman of the Joint Chiefs of Staff, tasked to make sure all had the best possible tools

- Must keep ahead of the adversary
- To do so the tech based was mobilized – primarily DoD labs and small businesses
  - If start cutting them for savings, the need to have the best possible tools won’t be met
- Curiously, a lot of good technology comes out of a war
  - In this war much has been about doing without people in the middle of hostilities
    - Drones and robots have helped immensely
  - All of this would have come along eventually but conflict provides the pressure
  - Medical advances have also been significantly stimulated
    - Not a reason to have a war, but it happens
    - Much has been done with the man-machine interface
    - Areas such as biomechanics, prosthetics, robotics
      - Recent milestone: first batch of prosthetic arms with wireless chips in the brain that work the arm and make the body believe it is part of itself
      - Experiments showed that injured warrior on the East Coast could move a mechanical arm on the West
    - Medical focus will last
    - Just now moving into main stream healthcare
- All these advances (from the view of the Vice Chairman) were paced by computational power
  - All areas of the military improved with increased computational power
  - Saw these improvements in areas such as lethality
    - The first Predator drones relied on analog systems
      - Were designed to eliminate the possibility of tinkering in the field
        - Each pixel had the company label on it
      - No longer can take 7 years to develop the next step in improvements
      - IEDs worked on a 30-day cycle of new fuze followed by a counter followed by another new fuze by the adversary
        - Can no longer start a conflict and wait 5 years for significant equipment upgrades
        - Moving from platform centric to system centric
- Example of this type of change in the civilian world: small car company in Phoenix
  - Makes only one or two cars at a time
  - Uses crowd-souring to identify what the car needs to be able to do
  - Today connectivity sells cars the way that power used to be most important to buyers
  - Methods not being used by the military – F-35 is a totally integrated to itself platform
- Predator went from analog system to basic digital to 720 to 1080 and is looking at “retinal”
  - Each upgrade was put into the entire fleet in a single year costing about $300M
    - Standard methods would cost $3-5B
  - Platforms are not where advances are made now
  - Must see the platform as just a truck
- As fighter pilot and also a Marine rifleman as all Marines are trained to be
  - Understood the need to have a system overhead that could see over the next hill
  - Drones can now do that sort of thing and do it 24 hours a day for days

Machines will not replace people
- 1997: computing reached first level of cognition when machines played against chess masters
  - Machines were fast and precise but not that good alone
Only people can provide the context
- Machines were much better when working with a person and vice versa
  - Rather like spell checking – you spelling gets better

- Example: concerns about illiteracy limiting what equipment the Afghans could be taught to use
  - Labs experimented to see if equipment could be operated using icons which could be learned intuitively – it could
  - Problem 1: desertion rates went up right after paydays because soldiers needed to walk their pay home to their families and would stay at least a little while
    - Could technology improve this?
    - Solution: gave out 1,000 IPHones but worried it would take 1-6 months to learn how to use them – it took 1-6 hours
  - Problem 2: Improve the army by getting tribal members to work with other tribes by getting to know them and improve cross-tribal communication
    - Could technology improve this?
    - Solution: developed a sort of *Afghan Idol* competition to be run on the IPhone

- These situations showed that there was very little understanding about the limitations of literacy
- **Bottomline:** Technology like Androids and IPHones have interfaces that make sense and so can be quickly learned since their operation is intuitive
  - Part of giving the soldier what he needs as fast as he needs it
  - Surveys of soldiers who have taken IPHones and IPAds to the field indicate some would rather leave their rifles behind rather than this technology
    - Gives them much better situational awareness and connectivity
    - Gives them a critical contextual understanding
  - Just now beginning to understand the importance of this and how it works

**Next big trend will be predictive analytics**
- Previously, the collection of data allowed warriors to see trends in what *had* happened
  - Now can go far beyond that
- Saying predictive analytics is rather like saying “plastics” in the Dustin Hoffman movie – it will make a tremendous difference in everything in the near future
  - Impact on war-fighting will be like the difference made by the huge advances in precision at the end of the Gulf War
- At the start of the Afghan War the US maintained 30-days of data storage in theater
  - Then for only $25M could have 90 days of storage before needing to send data home
  - Now beginning to use the Cloud to eliminate storage issue all together
  - As computational power grows with the Cloud or “Large Data” capabilities soldiers will:
    - Go beyond using data to schedule when to go on patrol and come back
    - They will have enough data to go directly to where problems are
      - Will not need to go patrol for problems
  - This changes the paradigm of the expert with a hammer sees all problems as nails
    - Will make a fundamental shift in warfare and other areas
    - Already seeing it with credit card companies that know that your card is being used in unusual locations or in unusual purchases
- These enhanced computational power capabilities are still rudimentary, developing
- Today to understand a country you would bring together all sorts of experts
  - Could bring in data from millions of “reporters” providing small bits of data
But no one head could fit it all in and make sense of it, but a computer could
Would be hard to identify which one person was behaving anomalously

- A good and nearly here man-machine interface could make these connections
  - Example: a chip was implanted in a mouse who was then taught to run a maze
    - The chip was removed and implanted in another mouse who was able to run
      the maze immediately
    - The mouse who no longer had the chip could also run the maze

As computational power grows the next major leverage point is in medicine
- A few years ago the goal of mapping an entire genome was announced
- Recently, a goal of mapping the genomes of everyone in Iceland was announced
- Sometime in the not too distant future computational power will allow us to map the genomes
  of everyone in the world
  - At that point, how we do medicine will become radically different
  - Kids will take this for granted and already understand the basic concepts involved
  - A fundamental shift

Leverage will not come in the size of military units or the capabilities of military platforms
- Need to stay ahead of your adversary
- Changes will start coming at the speed of changes in Moore’s Law (a matter of months) and not
  on the cycle of the government’s PPPS (a matter of years)
- Cost factors will be much less important than they are today
- Going back to the size comparison of military units: from armies to divisions to brigades to
  individual platforms
  - Could get down to a single ship for each coast – but it would be the best in the world
  - Problem: the US is a global power with global responsibilities
- Bottomline: This is something else we need to think through

Sequestration
- Wish there was a good way to predict what will happen
- The intent was good – make it so ugly that necessary changes were forced
- Problem: we have been an age and a generation of “Pay me/ Pay me. What have you done for
  me?”
  - Now must expect our children to pay for this
- It is not clear that the situation can be fixed
- Although you really do need a grand strategy you also must match your aspirations to your
  resources
- US must set priorities
  - Can have the best military or best medical care or best Social Security System
    - But not all three at the same time
    - Where are the trades? What is the balance?
  - Is it all the responsibility of the Congress or is the American will involved, too?

National Security Issues
- Ten years ago the promised solution was *jointness*
  - Jointness has developed over the years
  - Now military officers may know more about those in other services than in their own
    - Service rivalries are healthy, but...
In a foxhole or a cockpit, it is more about all the others you work with

- Now working with militaries from all over the world
  - Have gotten use to turning over responsibility of lives in combat to these others, not wanting to let them down
  - The future is in combined forces
  - As well as working with all other elements of our own government
- On the battlefield the military talks with State Dept and other military representatives
  - These sort of relationships do not happen in Washington

- Have been in Congressional discussions with SecState Clinton to support greater funding of “national security” requirements – not just DoD or State Dept. or USAID requirements
  - Will always need a good military as a backstop when other efforts fail
  - Also, no country can “do it all” alone today
    - Mutually assured destruction (MAD) won’t work when threats are so proliferated and sophisticated
    - Need lots of help and allies to face current threats – no country can have enough resources – too many flanks to cover

- When MAD was deliberated in the Cold War, the alternative was entanglement
  - Assumed that if defenses, economies, etc. were entangled then if one country tried to pull out it would do more damage to itself than to the group
  - Need to think through another arrangement now
    - Need to leverage relationships with our allies
  - NATO may not be the answer to the problem but it is not 180 degrees out either

- Example problem: tactical missile defense
  - No one country could cover the costs of missile defense for itself
  - Also, can’t cover all the necessary geography and radar angles
    - South Korea cannot protect itself from North Korean missiles without the missile defenses in Japan – and vice versa
    - MidEast has the same problem
  - Requires both active and passive elements
  - If one country pulls out, it loses much more than the overall organization
    - No matter how big that single country is
  - Is there something in this concept that would apply to areas like Commerce, Treasury, Homeland Security, etc.?
    - Need to bring new ways of thinking into all domains – air, space, sea, cyber
      - Currently building awareness systems in all these domains
    - Have seen that greater awareness at sea makes piracy harder
      - Want to do similar improvements with air and space systems, too
    - Will be able to move from just awareness to defense
    - In cyberdefense, should be able to let a country know that others are having a virus attack perhaps in time to make adjustments to protect themselves
    - At sea will not just go on piracy patrols but go to where the problem is or identify exactly those who are involved in missile proliferation
    - Need to think about how we can share all this information
      - How to bring everyone into the fundamental construct
      - Need to identify the attributes we want in such a system
Cutbacks and the Nuclear Triad

- Nuclear weapons are still on alert in the US and Russia and elsewhere
  - Deployed numbers are decreasing – 1,550 for the US/Russia after last treaty
  - Numbers on alert elsewhere are much lower – a few hundred at most
- But there are still many more not deployed – “the hedge”
- The cost to maintain this arsenal is very significant
  - What is driving the size of the arsenal now?
- Need to make decisions about modernization of the Nuclear Triad very soon
  - Any modernization decision will be a 50-year commitment
    - Will take 10 years to develop modernized versions of any of the systems
    - Would be another 10 years before all could be deployed
    - Then there would be a 30 year lifetime for those systems
    - Doesn’t matter if talking about SSBNs, ICBMs, or bombers
  - Bottomline: We could make this modernization decision without having a basic strategy or we could have a fresh debate about nuclear strategy
- Nuclear force now is mostly counterforce
  - Because of this, the Russians don’t like missile defense concept
    - If US decided to take out all Russian missile silos and used missile defense to weed out the leakers, could create a decapitation strike
  - Can solve this problem through treaties
    - Russian counterparts also understand this
- When US tries to tell other countries that they should have less weapons, huge US numbers do not help the situation
  - But can’t drop the numbers just to improve credibility
  - Others have nuclear weapons to protect their sovereignty
  - Others use nuclear weapons as shields – not swords
  - If nuclear weapons fell into the hands of adversaries without nation-state responsibility, they might use them as swords
- Problem: cannot un-invent nuclear weapons
  - Must decide what their role is in this century
  - Need to define what is meant by sufficiency
- Should not build platforms before there is a strategy
  - Concepts have not been discussed since the 1950s and 60s
  - Cost is also an issue – building the next SSBN would consume 75% of the Navy’s ship-building budget for the years it would be under construction
- Bottomline: the decision to modernize the Nuclear Triad should be the default position
- Another problem: While the US has used technology to build the best general purpose force ever, such a force does not count for anything when discussing strategic issues
  - All of the US investment in missile defenses, active and passive, and stand-off distances from terrorist threats don’t count either
  - Last 10-15 years of investments don’t really count
  - Today, if need to strike half a world away would need to use an ICBM
  - The 9/11s of tomorrow won’t be dealt with by nuclear weapons
  - No president wants to have only that choice
    - The military must provide more options to the President
- Speed is another important factor
o Aircraft that can go from Washington to L.A. in 11 minutes have been tested but will be at the slow end of warfare
o Directed energy and cyberwarfare will happen in milliseconds – speed of light
o The US military must adapt to these changes
o Cyber won’t replace the soldier
  ▪ Best when integrated with the soldier
  ▪ Soldiers must understand it from the beginning
  ▪ Can’t allow it to be locked up with own jargon
  ▪ And, yes, young soldiers will understand it intuitively

QUESTION & ANSWER SESSION

RE: The future of Joint niche organizations that came into being over the last several years
  • Organizations like JIEDDO (Joint IED Defeat Organization) are needed to handle problems that cross service boundaries
  • Problems were seen in the Gulf War where Army radios could not talk to Marine radios
    o Caused by separate acquisition system rules and service cultures
  • There are high level issues such as logistics, ISR, IEDs, etc. that require going horizontal across service boundaries
  • However, such organizations don’t survive well in the Service cultures
    o They are viewed as the bill payers during periods of cutbacks
    o Missile defense and command and control fall into this same area
    o Services are already raiding these outfits as if the war is over and won’t come back
      ▪ Yet mines have been around for centuries and will continue to be a problem in the future
  • There is a basic but flawed belief that “My service will take care of my people”
  • However, these organizations are probably going to lose funding as money is redistributed back to the platforms
    o Even though they provide asymmetric leverage
    o Pressures will be coming from the platform communities to bring funding back to them

RE: Support Structure Integration
  • Goldwater-Nichols legislation did not touch either the medical or acquisition areas of DoD
    o Need a way to legislate to make it happen now
  • Medicine is becoming a big problem because of the move toward joint hospitals
    o Finding that standards and procedures vary greatly by organization
    o Can’t provide the best care either at home or on the battlefield without moving beyond Service cultures
  • In Acquisition, the law is competent but there is a need to develop joint standards
    o Especially areas such as C² and logistics must have cross-service methods / capabilities
      ▪ Issues like billing across services must be worked out
  • IT can’t work on different sets of standards either
  • The IED fight is really the same for all the services
  • A Service culture is needed to build motivation but it needs to be tailored
    o It is not one size fits all
  • Bottomline: Solution may be a Goldwater-Nichols effort or something else, but we do need to get at the problems in medicine and acquisition
RE: Pacific Ocean Issues

- The Pacific is where the US does most of its trading but also where the longest supply lines are
  - So the area favors air and sea power
- Allegiances and relationships from the World Wars now need to be more reasonable
  - Permanent basing begins to look like occupation to others
  - US definitely doesn’t want to appear to be occupying or using others as surrogates
- Posture and basing is critical
  - Must remember that any fight over there would be a strategic fight
  - Can’t win a tactical fight at such large distances
- To prevent war there needs to be stability in the shipping lanes
  - Can’t be worried about the sovereignty of each little rock in the region
  - Countries need to have better context, more awareness of what is happening in their areas
  - Countries also need to have better capabilities to protect their sovereignty
    - But capabilities must be commensurate with those of their neighbors
    - Must avoid asymmetric capability comparisons with neighboring countries
  - It would be more realistic for the US to accept permanent access to these areas
- US must recognize that both it and China are the big gorillas
  - Need to figure out how to take care of the little guys
  - Need to take others into consideration when working on specific problems
  - A lot more could get done if the US could work better with China
    - The North Korea problem would probably be improved if the US stepped back and let China and South Korea try to work it out among themselves
    - Both China and South Korea have built roads and railroads right up to the border and are just waiting for the opportunity to go in
      - Commerce could help a great deal in opening North Korea
- Problems in the ocean exist but can be worked out
  - Who controls mining at the bottom of the sea?
  - Where are the lines of authority in different contexts?
  - Basic problem: there is no venue to sit down and discuss these issues
- Biggest fear for China and the US is that a small third party would pull them into conflict
- More commercial intercourse, trade, diplomatic exchanges could help tie China more closely to the US
- Bottomline: do not demonize China

RE: Man-Machine Interfaces

- Of the 3 levels of cognition we are well into the 2nd with predictive analytics
- No computer today tries to come up with ways to do its tasks better or differently
  - People bring that art into the effort
  - Both man and machine learn more quickly when brought together on a problem
- There have been similar debates with older technologies in warfare
  - With the first aircraft – pilots were not considered part of the fight
  - Even bombers in Vietnam were considered outsiders who went home at night or were too far above the fight
  - Now drone pilots a half a world away are seeing the same stresses of battle, just
without the possibility of being in harm’s way

- This is a cultural evolution
  - Man and machine work best when working together
  - Time delays for C² from half a world away are not an issue – only about 8 second delays
  - Man-machine interface issues:
    - Can the person who is not there have the proper context?
    - Can the machine that is there accommodate fast enough for person far away who lacks the full context?
  - Ten years ago if you had a problem with a tank or something on the battlefield you would put the problem on the back of the individual
    - F-4 in Vietnam was adapted from a fighter to bomber by the person in the cockpit
    - Today the person can’t adapt that well because of the time constraints involved
- Bottomline: Sophistication of warfare today requires reliance on that man-machine interface

RE: Taxing to Share the Pain of Warfare

- Only in the last 6 months or so have there been discussions about using taxes so that everyone in the country feels the pain of the conflict
- May be a way to pay for the war but not really a way to go to war
  - Can’t use pay-as-you-go in war
  - Can’t decide to buy a new plane tomorrow and then try to get the money for it
  - Such a system is not flexible enough
- Some costs of war are also displaced by 30 years
  - The 20-somethings who are injured in the war will be needing more care when they are in their 50s
  - Already not doing a good job of this
  - This is something else that needs more debate

RE: Involving Other Elements of the Government

- NIH and HHS have become new players in the NSC
- Learning that they have a lot of information to share especially on biological and related threats
- On their side, they have not thought about epidemics that could occur by intent
  - The scale of a natural versus an intentional outbreak may be different
  - By the time you can figure out whether a bird flu is natural or induced, it is too late
    - So need to start working with some assumptions
    - Neither can you wait for 4-5 years of drug testing
- Bottomline: Must find ways to get this understanding into their culture in order to be ready while also learning to understand the risk calculations under which they must operate
  - These issues must be addressed but haven’t been
  - These organizations must be at the table and well before problems arise