



ARROYO CENTER

***The Four RMAs (Ways of War) of the 20th
Century
A Hegelian Cycle of Thesis and Antithesis?***

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Defining a Revolution in Military Affairs (RMA)

“Revolution”= Radical and rapid break from the status quo

Note: “Rapid” in this case may mean several decades

Soviet concept of three 20th century “military technological revolutions” (MTR) expanded/refined by OSD’s Net Assessment as the “revolution in military affairs” (RMA)

A RMA (viewed as a “way of war”) contains a more complete set of change indicators than a MTR

- **New Technology**
- **New modes of production**
- **New modes of human mobilization**
- **New Doctrine/Concepts of Use**
- **New Organizations with advocates**
- **New training/education**

A major conceptual question emerges: Is the concept of guerrilla/partisan warfare (“revolutionary warfare”) an RMA?

The Four RMAs of 20th Century

RMA – I (1914 – 1945)

- Emerges during World War I and matures in World War II – Roots in the RMAs of the 19th century – development of land and air combat vehicles

RMA – II (1945 – 1972)

- Emerges during World War II and matures during the Cold War (World War III) – development of nuclear weapons

RMA – III (1930 – 1975)

- Emerges prior to World War II during Sino-Japanese war as “Maoist Revolutionary Warfare” and re-emerges during the current global war against radical Islam (World IV?) – development of strategic guerilla warfare

RMA – IV (1954 – Current)

- Emerges during World War III and matures during the global war against radical Islam (World War IV?) – development of precision munitions/network centric warfare

20th Century RMAs and Cycle of Thesis and Antithesis

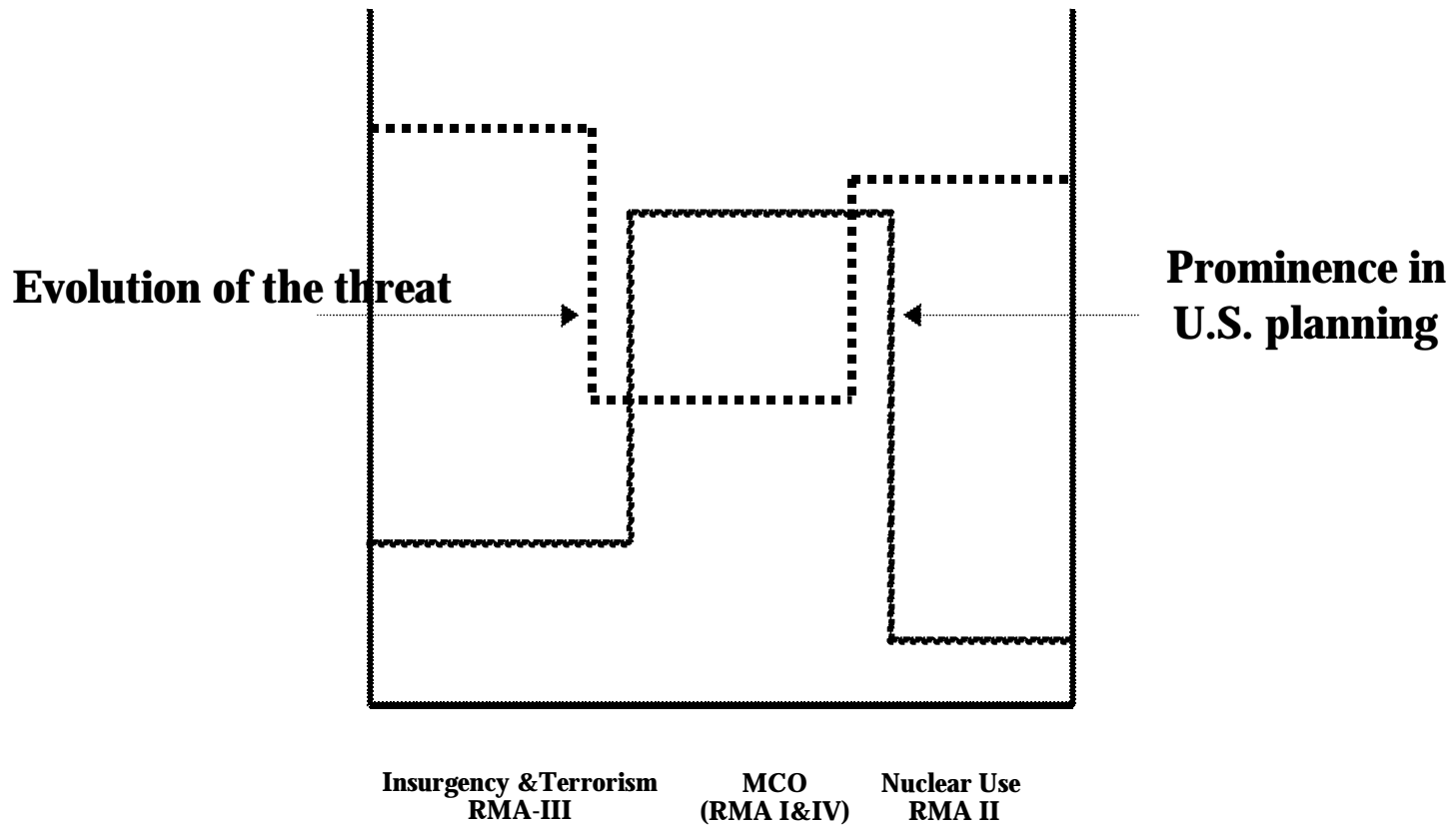
- **Post Cold War “transformation”:**
 - Network enabled forces armed with precision munitions and superior situation awareness (RMA – IV) can easily defeat combined armed forces equipped primary with combat vehicles and World War II type organizations and doctrine (RMA – I)
 - Current concept of “transformation” is too narrow and focused on the least challenging threats
- **Hypotheses:**
 - The most effective counter to an RMA – IV equipped and organized armed force is not replication of an RMA – IV force rather the acquisition of RMA – II technologies, specifically nuclear weapons and their reliable delivery by long-range guided missile
 - Alternatively, an effective counter to an opponent armed with RMA – I, II, and IV capabilities is to rely upon the “revolutionary warfare” tools and techniques of terrorism and insurgency warfare (RMA – III)
 - Most worrisome opponents can exploit both RMA – II and RMA – III
 - RMAs demarcate different domains of warfare that can interact temporally, rather than being analogous to periods of geological history

Defining the Current Concept of “Transformation”

“Transformation of military affairs” = the U.S. military establishment focused on exploiting RMA-I (combat vehicles) to that of RMA-IV (precision munitions)

- Themes such as “network centric warfare,” total knowledge dominance,” “reconnaissance strike operations,” and “Inside the OODA loop”
- Advocates of “transformation” favor investment in C4ISR in favor of next generation combat vehicles if budgets are constrained
- Basically this is a 40 year old argument that first generation guided weapons such as SAMs,ASMs and ATGMs would render the combat aircraft, surface warships, and MBTs obsolete – see Khrushchev response to early ATGM tests against MBTs
- After seventy years of development RMA-IV has provided air power advocates credible operational capability
- Image of war is that of a high technology naval engagement or an air campaign – see planning bias for OIF (failure to plan for Phase IV)
- The military and geo-strategic implications of RMA-II (nuclear weapons) and RMA-III (revolutionary warfare) are downplayed and/or ignored

The Challenge of a 21st Century Adaptive “Threat” A Different Kind of “Transformation”



The Elements of the 19th Century RMAs

Two dramatic period of change in character of war during 19th Century

- **Phase One (1820-1870)**

- Nationalism from Napoleonic era and mass conscription
- First wave of industrialization and mass production
- Steam engine and the railroad and steamship
- Telegraph
- Rifled Musket → repeating rifle → 1st generation machine gun
- Iron → steel
- Ironclad/steam powered warships
- Print as the dominant means of mass media
- *The Civil War and the Franco-Prussian War*

- **Phase Two (1870-1905)**

- Second generation of mass industrial production
- Otto-cycle and Diesel-cycle internal combustion engines
- Dynamo and the electric power grid
- First global digital internet – global telegraph
- Telephone
- Breach loading naval rifles
- Quick firing light artillery (French 75)
- Maxim machine gun and bolt action multi-shot rifle
- Barbed wire
- Naval optical fire control and continuous aimed fire out to the horizon
- Coal fire steam power steel armored warships
- The submarine and the torpedo
- *The Russo-Japanese War and the Boer War*

On the Eve of World War I

Precursor to RMA-I

Debates about the implications of the second 19th century RMA

On Land Warfare

- Mass mobilization armies – reliance on the railroad and telegraph – theory of striking first
- Obsession about demographics
- War of operational maneuver – Scheiffen Plan and French offensive plans

Two points of view:

- Belief in superiority of morale over material – the offensive spirit – French view
- Fear of stalemate and protracted mass production dominated struggle – Ivan Bloch's vision
- Consensus of military planners that war of the future would look like Sedan in 1870 and not Port Arthur of 1905 or the siege of Richmond during the U.S. Civil War

On Naval Warfare

- Rapid emergence of the *Dreadnought*-class capital ship
- The challenge of the French school – the submarine, torpedo, and commerce raider

On Air Warfare

- 1st generation aircraft as a means for battlefield reconnaissance

Fully Realized Components of RMA – I

1914 - 1944

- **Combat aircraft**
 - Biplane x 2 lmg → Monoplane x 4 lmg → Monoplane x 4+ hmg/automatic cannon
 - Biplane bombers with few hundred pounds payload → theater range multi-engine monoplane with 10,000+ payload
- **Armored vehicles**
 - MarkIV → *Sherman M-4* → *King Tiger*
 - Trucks → armored half-tracks
 - Tractor towed artillery → self-propelled artillery
- **Radio**
 - Allowed command of dispersed forces and joint/combined integration
 - Emergence of SIGINT as powerful warfighting tool
 - Emerges as the dominant means of mass media
- **Coal-fired warship steam engines replaced by fuel oil fired turbines and diesels**
 - Iraq as the RN's gas station
- **Submarine emerges as very potent commerce raider**
 - Nearly cripples UK during World War I & II, cripples Japan during World War II
- **Aircraft carrier replaces the battleship as the capital ship**
- **Chemical weapons**
 - Matured rapidly during World War I but used banned in 1925 – with exceptions
deterrence of use holds during World War II

***War still matter of national mass mobilization of RMA – I enabled forces
– “brute force” still matters***

Fully Realized Components of RMA – II

1944 -1972

- Nuclear weapons (1st generation fission → 2nd generation fission-fusion)
 - Massive numerical expansion by U.S. and S.U during the Cold War –the MIRV phenomenon during the late 1960s
 - The strategic offense dominates the strategic defense – the 1972 ABM Treaty
- Nuclear powered submarines – SSBN as the new *Dreadnaught*
- Theater range piston engine heavy bomber → Transoceanic range jet bomber with aerial refueling
- Long-range robot bombardment
 - V-2→Transoceanic range ballistic missiles
 - V-1→ Theater range cruise missiles
- Emergences and maturation of space flight capabilities
- Radar → Electro-optics
- Emergences of mainframe computers
- Television emerges as dominant means of mass media

Gaining RMA – II technology and production capacity begins to rival mass mobilization and industrial production as national priority

“Revolutionary Warfare” or RMA-III

1930 – 1975

Partisan or “guerrilla” warfare emerges as the “strategy of the weak” during the Spanish Peninsula campaign 1808-1814

- Noteworthy strategic success for UK

During the 19th century partisan warfare is viewed as a violation of the laws of armed conflict

- Extensive use in the West during the U.S. Civil War
- American Indian resistance
- Various anti-colonial popular resistance movements

Concept of partisan/guerrilla war matures during 20th century

- Boar War
- Revolutionary and total war emerges from Chinese resistance to Japanese invasion and civil war during the 1930
- Wide spread use during various post – World War II anti-colonial resistance movements
 - Successes against European empires
- Vietnam and Afghanistan are two great success stories
 - Key role of outside assistance from a sanctuary

Emergence of AQ as a global radical Islamic insurgency

- Prospect of hyper-terrorism including the use of nuclear weapons
- Insurgent exploitation of the fruits of globalism
- Need for “total societal war” response to defeat this form of warfare

Current experience in Iraq with multiple insurgencies

Maturing Components of RMA – IV

1955 - Present

Emergence of silicon enabled warfighting systems

- **Airborne and space based sensors**
 - Film photo → electro-optical → radar → FLIR → Multi-spectral → hyper-spectral
- **Computers**
 - Vacuum tubes → transistors → large scale integrated circuit → Very large scale integrated circuits → “Moore’s Law”
 - Mainframe → PC → ubiquitous microprocessor
 - SAGE air defense command centers → AWACS → CENCTOM command centers
- **Global Communications**
 - Space based communications
 - Television and radio mass media challenged by the “narrow casting” of the Internet , cable television, and high bandwidth satellite transmissions
- **Satellite based Navigation**
 - *Transit* → NAVSTAR (GPS)
- **Guided munitions**
 - The first generation SAMs and ATGMs emerge in the 1950s
 - Surface to air missiles → laser guided bombs → families of PGMs for all aspect of combined arms warfare

Gaining superiority requires mastery of RMA – IV technology and capacity to acquire professional military to exploit potential

RMA-II Viewed as Efficient Counter to RMA-I superiority The Cold War “asymmetric” response

- **Using nuclear weapons to counter “conventional” superiority during the 1950s and early 1960s**
 - **Eisenhower's New Look**
 - **1957 NATO decision to rely on nuclear weapons to counter the Red Army – an economically efficient “asymmetric” response**
 - **Khrushchev’s “new look” including the 1962 Cuban Missile Crisis use of nuclear armed forces to counter U.S. superiority in Caribbean – classic example of strategic use of asymmetric military means**
 - **DeGaulle’s commitment to a nuclear weapon program**
 - **China’s simultaneous development**
 - **Emergence of an Israeli nuclear program**
 - **Clandestine Swedish and Swiss programs**
- **A rationale for the overt Pakistani and Indian nuclear programs**

The Challenges of Dealing With Opponents that Exploit RMA-II and III

Neutralization option of emerging 1st generation nuclear armed states may be feasible with major investment in late RMA – IV and RMA – V capabilities

- North Korea and Iran with emerging 1st generation capability

Cold War experience suggests that major powers will have the capacity to defeat strategic counterforce, passive defense, and active defense investments even by the United States

A key strategic question is the threshold of nuclear capability that counters a neutralization strategy using RMA-IV capability

- India/Pakistan with maturing 1st generation capability?
- China with a maturing 2nd generation capability?

When all else fails rely on containment and assured retaliation (MAD)?

Challenges:

- Emergence of 21st century RMA-III that exploits the technologies of RMA-II and RMA-IV
- The ineffectiveness of RMA-II to deter a RMA-III campaign of hyper terrorism
- What to do about non-state actors who acquire nuclear weapons and are not deterred?
- How to respond to a nuclear armed state that uses RMA-II to provide sanctuary while conducting strategic warfare with revolutionary warfare tools and techniques?

Response to 21st century RMA –III requires a new kind of “total war” response using all means of state power – Development of RMA-V?

“Defeating” An Emerging Nuclear Armed State

Requirement to “defeat” an emerging nuclear armed state:

- **Radically enhanced strategic and operational targeting capability**
- **Ultra high performance reconnaissance-strike capability**
- **Expeditionary forces capable of operating under nuclear attack**
- **Just-in-time theater logistics from mobile (sea based) and defended locations**
- **Very robust/ultra high performance active defenses**
- **Equipment hardened to wide area nuclear EMP**
- **Theater support for response and recovery**

How much does this challenge require the exploitation of late generation RMA-IV or does it need a true military technological RMA-V?

Note: RMA-III does not defeat RMA-II but renders it ineffective as a deterrent – see 9/11 and the uselessness of the U.S. nuclear deterrent forces

Is RMA V Defined by its Effectiveness Against RMA-II and RMA-III?

RMA-V = the first RMA of the 21st century?

Some possible elements:

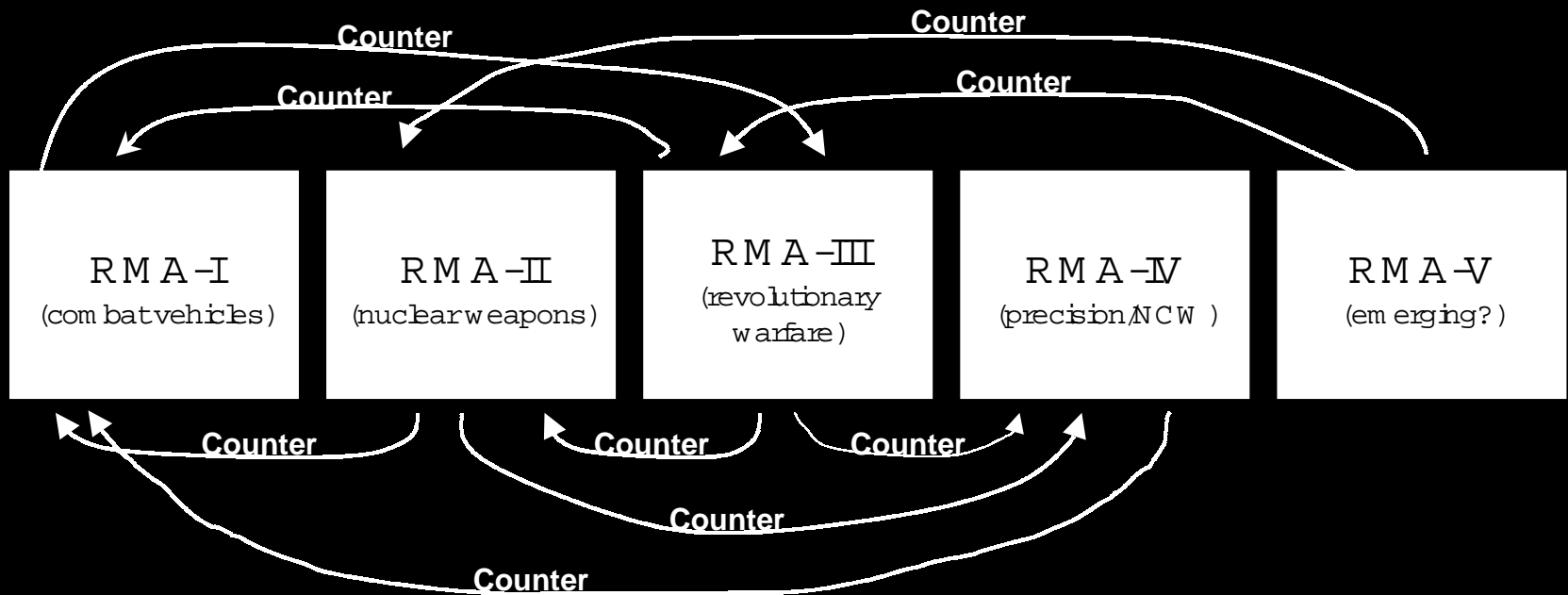
- Total societal situation awareness
- Exploitation of nano-technology for ubiquitous surveillance for target acquisition and BDA
- Very high performance directed energy weapons
- EMP hardened sensors, communications, and computers
- Next generation perception management tools and techniques
- Next generation computer network operations
- Next generation of autonomous combat robots
- Leap ahead in recce-strike
 - Detected masked fissile material
 - Detecting and destroying deeply buried targets
 - Detecting LO aircraft/missiles
 - Detecting LO submarines
- Anti-personnel and material bio-weapons?
- Human/machine integration – cyborg era?

Some of these capabilities may take several decades to fully emerge

In a global economy with technology diffusion U.S. long-term competitive advantage unclear

Many of these capabilities may menace the viability of a democratic republic or parliamentary democracy

The RMA Thesis/Antithesis Interaction?



The different RMAs can be viewed as different domains or "ways of war." Not unlike the game of "rock, paper, and scissors" the various RMAs interact with each other in dynamic process of thesis and antithesis. Put simply the emerging RMA-V can only be defined by its ability to counter prior RMAs, specifically RMA-II and RMA-III or the combination of both.

Do Cultural Differences Play Here?

Do different cultures have a different propensity and adeptness toward different “ways of war” (RMAs)?

Two contemporary opponents:

- **American Culture:**
 - Belief in the scientific revolution and human progress
 - Separation of religion and state
 - Belief that capital can substitute for labor
 - RMA – I and RMA – IV attractive combination → leads to wars of limited liability and costs – the song of “transformation”
 - When faced with total war threat → RMA-II (assured retaliation)
- **Islamic Jihadist Culture**
 - Belief in the centrality of Islam with unchanging belief structure
 - Merger of religion and state
 - Faith will prevail over material superiority
 - Belief in total and protracted warfare
 - RMA – II and RMA – III attractive combination → leads protracted and total wars – the song of “jihad”

To defeat the Jihadist opponent does the United States need create a new “way of war” (RMA – IV)? As suggested, will this new RMA change at least the political culture of the American republic → authoritarian security state?