An Evaluation of the Analogy Between Nuclear and Cyber Deterrence

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Outline

• Frameworks and Methodology
  o Two Questions
  o Definition of Revolution in Military Affairs
  o Definition of Strategic Cyber Weapons
  o Interviews

• A Revolution in Military Affairs?
  o Successful case: Nuclear weapons
  o Unsuccessful case: Strategic Cyber Weapons

• A Strategic Deterrent?
  o Characteristics
  o Evaluation

• Future, Further Research, and Conclusion
  o Three paths
  o Research Opportunities
Two Questions

1. Do strategic cyber weapons constitute a revolution in military affairs?

2. Do strategic cyber weapons have the strategic deterrent characteristics of nuclear weapons?
Strategic Cyber Weapon

Malware that irreversibly neutralizes centers of gravity in cyber-dependent economic, military, and political systems and infrastructure
Severity of Cyber Threats

Intensity vs. Frequency

- Strategic Cyber Weapons
- Cyber Terrorism
- Cyber Espionage
- Cyber Vandalism

State Capability Cutoff
Revolution in Military Affairs

1. An advance in technology
2. An adaptation in military strategy or doctrine
3. A fundamental change in the balance of power on the battlefield either by the replacement of an old power or by the creation of a new one
4. A decisive victory
Interviews Conducted

- Barack Obama, President of the United States
- Robert Gates, Secretary of Defense
- Bill Perry, Secretary of Defense
- General Michael Hayden, Director of National Security Agency and Central Intelligence Agency
- Admiral Cecil Haney, Commander of Strategic Command
- General Bob Kehler, Commander of Strategic Command
- Admiral Jim Ellis, Commander of Strategic Command
- Kenneth Chennault, Chairman and CEO of American Express
- Anthony Earley, Jr., Chairman and CEO of Pacific Gas and Electric
- Chris Painter, Cyber Coordinator for State Department
- Michelle Markoff, Deputy Cyber Coordinator for State Department
- Dr. Phyllis Schneck, Deputy Undersecretary for Cybersecurity and Communications Department of Homeland Security
- Dr. Robert Jervis, Columbia University
- Dr. Thomas Schelling, RAND Corporation
- Dr. Martin Libicki, RAND Corporation
- Dr. Siegfried Hecker, Director of Los Alamos National Laboratories
- Dr. Sidney Drell, Deputy Director SLAC National Accelerator Laboratory
- Dr. Jackie Schneider, Elliot School of International Affairs
- Mark Ghilarducci, Director of California Governor’s Office of Emergency Services
- Colonel Matteo Marremucci, 318th Cyberspace Operations Group, 688th Cyberspace Wing
- Colonel James Wakefield IV, Air Force
- Dr. Emily Goldman, Cyber Command
- Dr. Michael Warner, Command Historian, Cyber Command (on background)
- Kirk McConnell, Staff Member on Senate Armed Services Committee
- Kevin Gates, Staff Member on House Armed Services Committee
- Jim Lewis, Center for Strategic and International Studies
- Kim Zetter, Wired
Nuclear Revolution in Military Affairs

- Advance in Technology ✓
- Change in doctrine and strategy ✓
- Fundamental change in the balance of power ✓
- Decisive victory ✓
Cyber Revolution in Military Affairs

- Advance in Technology ✓
- Change in doctrine and strategy ✓
- Fundamental change in the balance of power ✗
- Decisive victory ✗

[Image: A cybersecurity command center with personnel working on computers and monitoring screens.]
Strategic Deterrent Characteristics
Characteristics of Strategic Cyber Weapons
Future, Further Research, and Conclusion
“Make no mistake, this weapon will change absolutely nothing.”

-French Director General of Infantry, commenting on the machine gun before the French parliament, 1910