

IP 657
Fall Semester 2005
Thursday, 4-6:50 PM, M127

Professor Clay Moltz
Office Phone: 647-6575
Office hours: 4-5 PM Wednesday
and 4-5 Friday, 215 McGowan

TECHNOLOGY AND INTERNATIONAL SECURITY

This seminar focuses on the interplay between technological development and international security in both historical and conceptual terms. Major themes include the increasing range of weaponry over time, its growing lethality, and the increasingly rapid pace of technological developments affecting the battlefield in recent decades. Social, economic, and organizational factors affecting the development of weapons technology will also be discussed, such as revolutions in civilian transportation, communications, and industry. In addition, military-institutional *impediments* to rapid technological change will be analyzed.

The course is divided into three main sections. The first covers the period from the late 1300s to World War II, analyzing the development of key military technologies (including the long bow, machine gun, and aircraft) and their impact on warfare. This section also considers the effects of industrialization beginning in the early 1800s and such advances as the steamship, the locomotive, the telegraph, and the growing “professionalization” of society and the military. The second section examines the nuclear revolution and technological development during the Cold War (1945-91), including the massive build-up of nuclear forces, the increasing role of national weapons laboratories in defense policy, and the economic, environmental, and health consequences of nuclear production. The third section covers post-Cold War weapons, including the emergence and further development of precision-guided munitions, military space systems, ballistic missile defenses, UAVs, and new types of non-lethal weapons.

Each student is required to write a mid-term paper (8-10 pgs., choosing from a list of assigned topics) and a research paper on an emerging technology (8-12 pgs., on a topic of the student’s choice). Two short in-class presentations (one on a past technology and one on an emerging one) will also be required. Regular seminar attendance and active participation in discussions is expected and will factor into grading.

Please note that this course will meet on some occasions for three hours (instead of the normal two), as a number of films on particular technologies and their impact will be shown during the semester.

The following books are **required** and should be purchased individually by students via Amazon.com or BN.com (no books will be ordered by the bookstore):

- MacGregor Knox and Williamson Murray, editors, *The Dynamics of Military Revolution: 1300-2050* (New York and Cambridge: Cambridge University Press, 2001)(hardcover).

- Martin Van Creveld, *Technology and War: From 2000 B.C. to the Present* (New York: The Free Press, 1991)(paperback).
- Herbert F. York, *The Advisors: Oppenheimer, Teller, and the Superbomb* (Stanford, CA: Stanford University Press, 1989)(paperback).
- Stephen I. Schwartz, ed., *Atomic Audit: The Costs and Consequences of U.S. Nuclear Weapons since 1940* (Washington, D.C.: Brookings Institution Press, 1998)(paperback).

Other **required** course readings will be available **on reserve** at the MIIS library. It is the responsibility of all participants in the seminar to do this reading *before* each class and to be prepared to discuss it intelligently. The professor encourages students to write down questions/comments and bring them to class each week.

SCHEDULE OF MEETINGS AND READING ASSIGNMENTS

1. September 1 Introduction: Technological Innovation and Weapons Development

Readings: Rudi Volti, “Weapons and Their Consequences,” in *Society and Technological Change* (New York: St. Martin’s Press, 1988), pp. 171-185 [**on reserve**].

Hornell Hart, “Acceleration in Social Change,” in Noel de Nevers, ed., *Technology and Society* (Reading, MA: Addison-Wesley, 1972), pp. 51-79 [**on reserve**].

Part I: Technological Developments before 1945

2. September 8 The Development of Military Technologies from Antiquity to the 15th Century

Readings: Martin van Creveld, Introduction and Chapters 1-5, in *Technology and War*.

Clifford J. Rogers, “As if a new sun had arisen,” Chapter 2, in *The Dynamics of Military Revolution*.

John Keegan, *The Face of Battle* (New York: Dorset Press, 1976), pp. 82-86 [**on reserve**].

“Chivalry,” at:
http://encarta.msn.com/encyclopedia_761576241/Chivalry.html.

“Feudalism,” at:
http://encarta.msn.com/encyclopedia_761568817/Feudalism.html.

In-class film (segment): *Henry V*

3. September 15 Mass Armies and the Rise of Nationalism

Readings: Martin van Creveld, Chapters 6-10, in *Technology and War*.

John Lynn, "Forging the Western army in seventeenth-century France," Chapter 3, and MacGregor Knox, "Mass politics and nationalism as military revolution: The French Revolution and after," Chapter 4, in *The Dynamics of Military Revolution*.

4. September 22 Industrialization and 19th Century Military Revolutions

Readings: John Keegan, "Logistics and Supply," in *A History of Warfare* (New York: Vintage Books, 1994), pp. 301-315 **[on reserve]**.

Martin van Creveld, Chapters 11 and 15, in *Technology and War*.

Mark Grimsley, "Surviving military revolution: The U.S. Civil War," Chapter 5, and Dennis E. Showalter, "The Prusso-German RMA, 1840-1871," Chapter 6, in *The Dynamics of Military Revolution*.

5. September 29 Changes in Naval Technology: 1830-1918

Readings: Martin van Creveld, Chapter 14, in *Technology and War*.

Holger H. Herwig, "The battlefleet revolution, 1885-1914," Chapter 7, in *The Dynamics of Military Revolution*.

Alfred Thayer Mahan, "Introductory," *The Influence of Sea Power upon History: 1660-1783* (1890) **[on reserve]**.

"[Japanese] Armament and Equipment," at:

<http://www.russojapanesewar.com/japanese-hdw.html>

"The Armament and Equipment of the [Russian] Fleet," at:

<http://www.russojapanesewar.com/russian-hdw.html>

"Torpedo Attack, Port Arthur," at:

<http://www.russojapanesewar.com/torp-attk-pa.html>

"Tsushima," at:

<http://www.russojapanesewar.com/tsushima.html>

In-class video: *Revolutionary Technologies* (submarines)

6. October 6 New Technologies for Land and Air Warfare: 1914-38

Readings: Jonathan B. A. Bailey, "The First World War and the birth of modern warfare," Chapter 8, in *The Dynamics of Military Revolution*.

Martin van Creveld, Chapters 12 and 13, in *Technology and War*.

Frederic J. Brown, "Chemical Warfare: A Study in Restraints," and Edward L. Katzenbach, Jr., "The Horse Cavalry in the Twentieth Century," in Robert J. Art and Kenneth N. Waltz, eds., *The Use of Force* (University Press of America, 1988) **[on reserve]**.

In-class video: *Revolutionary Technologies* (machine gun and aircraft)

Part II: The Nuclear Age and Technological Developments during the Cold War

7. October 13 The Technological Revolution from 1940 to 1945

Readings: Williamson Murray, "May 1940: Contingency and fragility of the German RMA," Chapter 9, in *The Dynamics of Military Revolution*.

Kevin O'Neill, in *Atomic Audit*, pp. 53-59.

Louis Morton "The Decision to Use the Atomic Bomb," all in Robert J. Art and Kenneth N. Waltz, eds., *The Use of Force* (University Press of America, 1988) **[on reserve]**.

Manhattan Engineer District, "The Atomic Bombing of Hiroshima and Nagasaki," June 29, 1946, at:
<http://www.yale.edu/lawweb/avalon/abomb/mp09.htm>.

In-class film: *The Day after Trinity*

October 17 Mid-term paper assignments due by 5 PM

8. October 20 Delivering the A-Bomb and Developing the H-Bomb

Readings: Chapter 2 (pp. 105-139 only), in *Atomic Audit*.

Herbert F. York, *The Advisors*, Preface, pp. xi-xiv, 3-137.

9. October 27 Technologies for Nuclear Targeting, Defense, and Intelligence

Readings: Chapters 4 (pp. 269-302 only) and 3 (pp. 197-225 only), both in *Atomic Audit*.

George and Meredith Friedman, Chapter 13, in *The Future of War*, pp. 305-330 [**on reserve**].

In-class film: *Nukes in Space*

10. November 3 The Human, Environmental, and Economic Costs of Nuclear Technology

Readings: Kevin O’Neill , Chapter 1 (pp. 35-53), Arjun Makhijani and Stephen I. Schwartz, Chapter 7 (pp. 394-432), William J. Weida, Chapter 10 (pp. 519-543), and Stephen I. Schwartz, Chapter 11 (pp. 545-557), all in *Atomic Audit*.

“Operation Plowshare,” Answers.com, at:
<http://www.answers.com/topic/operation-plowshare>.

In-class film: *Atomic Journeys: Welcome to Ground Zero*

Part III: Military Technology in the 21st Century

11. November 10 The High Technology Battlefield and PGMs

Readings: George and Meredith Friedman, Chapter 11 in *The Future of War*, pp. 253-281 [**on reserve**].

Lawrence Freedman and Efraim Karsh, “How Kuwait Was Won: Strategy in the Gulf War,” in *The Use of Force*, pp. 258-271 [**on reserve**].

Martin van Creveld, Chapter 16, in *Technology and War*, pp. 235-249.

Williamson Murray and MacGregor Knox, “Conclusion: The future behind us,” Chapter 10, in *The Dynamics of Military Revolution*, pp.175-194.

12. November 17 Missile Defenses and the Possible Weaponization of Space

Readings: Clayton K.S. Chun, “Expanding the High Frontier: Space Weapons in History,” *Astropolitics*, Vol. 2, No. 1 (Spring 2004) [**on reserve**].

Joel R. Primack, “Debris and Future Space Activities,” and Steven Lambakis, “Putting Military Uses of Space in Context” in Moltz, ed., *Future Security in Space: Commercial, Military and Arms*

Control Trade-Offs, CNS Occasional Paper #10, at:
<http://www.cns.miis.edu/pubs/opapers/op10/op10.pdf>.

Theresa Hitchens, “Technical Hurdles in U.S. Missile Defense Agency Programs,” David E. Mosher, “The Budget Politics of Missile Defense,” and Phillip J. Baines, “Prospects for ‘Non-Offensive’ Defenses in Space,” all in Moltz, ed., *New Challenges in Missile Proliferation, Missile Defense, and Space Security*, CNS Occasional Paper #12, at:
<http://www.cns.miis.edu/pubs/opapers/op12/index.htm>.

13. December 1 New Weapons: Changing the Battlefield of Tomorrow?

Readings: Lt. Col. James C. Duncan, “A Primer on the Employment of Non-Lethal Weapons,” *Naval Law Review*, Vol. 45, No. 1, 1998, at:
<http://www.au.af.mil/au/awc/awcgate/law/nonlet2.pdf>.

Lt. Col. Jay Stout, “Using Armed UAVs?,” Lt. Cmdr. Donn W. Keels, Jr., “A Different Kind of Pick-Me-Up,” and Ensign Nathan Brasher, “Unmanned Aerial Vehicles and the Future of Air Combat,” all in *Proceedings* (U.S. Naval Institute), July 2005 [**on reserve**].

Defense Science Board, “Unmanned Aerial Vehicles and Uninhabited Combat Aerial Vehicles (February 2004), at:
<http://www.fas.org/irp/agency/dod/dsb/uav.pdf>. [Read Executive Summary and skim rest of report.]

14. December 8 Student Presentations of Individual Research Projects

December 12 **Final papers due by 5:00 PM to professor—unexcused late papers will receive a reduction in grade.**