Thinking about Military History in an Age of Drones, Hackers, and IEDs

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Violators will receive a sternly-worded e-mail. Or at least a sharp glare from across the room.
Thesis: Robots and cyber war constitute a Revolution in Military Affairs (RMA) that is currently occurring and will permanently alter warfare. The United States, which leads in the creation and adoption of these forms of technology, has the unique opportunity to shape the RMA and prevent some of its negative consequences.

- RMAs **permanently alter** the nature of warfare. Early adopters of RMA changes obtain a **decisive advantage** over opponents who do not adapt.

- RMAs do not occur instantaneously or in a vacuum, they are the **sum** of changes in technology, doctrine, and strategy.

- Robotic and Cyber systems are changing very quickly, but are the product of **decades** of innovation and experimentation.

- Robots will not only change how wars are fought, they will also change the decision-making cycle for **whether to go to war**.

- Cyber war will blur the **civil-military divide**.

- These technologies create a host of **legal and ethical issues**. Ignoring these concepts will not make them go away.
Revolution in Military Affairs:

When a technological, doctrinal, or strategic innovation fundamentally alters warfare so as to render previous conventions of warfare obsolete.

The result of an RMA is a period of asymmetry, followed by widespread adoption of the change and frequent reshuffling of power dynamics. Being first is not always a lasting advantage in an RMA.

Nicolai Ogarkov
Typical Siege Durations

High Middle Ages

- Calais: 1346-47, 12 months
- Cherbourg: 1418, 7 months
- Rouen: 1418-19, 6 months
Artillery Development
# Typical Siege Durations

<table>
<thead>
<tr>
<th>Location</th>
<th>Time Period</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calais</td>
<td>1346-47</td>
<td>12 months</td>
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<tr>
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<td>1449</td>
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</tr>
<tr>
<td>Bayeux</td>
<td>1450</td>
<td>16 days</td>
</tr>
<tr>
<td>Blaye</td>
<td>1451</td>
<td>5 days</td>
</tr>
</tbody>
</table>

**High Middle Ages**

**Late Middle Ages**

**Gunpowder Revolution**

![Diagram of siege architecture](image)

The normal glacis slope was between 1:16 and 1:40 and rarely steeper than 1:10.
Neuf-Breisach about one mile from the Rhine and the border with Germany. Built by Vauban between 1697 and 1700 to counter German fortress at Breisach on the Rhine.
## Typical Siege Durations

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**Gunpowder Revolution**

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**Fortress Revolution**

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<th>Early Modern Period</th>
<th>Haarlem</th>
<th>1572-73</th>
<th>7 months</th>
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<tr>
<td></td>
<td>Leyden</td>
<td>1573-74</td>
<td>12 months</td>
</tr>
<tr>
<td></td>
<td>Breda</td>
<td>1624</td>
<td>9 months</td>
</tr>
</tbody>
</table>
Spanish Tercio
Swedish Tactical Formations
under
Gustavus Adolphus

The Brigade
Each block is 6 ranks deep

216 Pikes

96 Muskets Per Side

192 Musketeers

216 Pikes

216 Pikes

192 Musketeers
Swedish Squadrons

Tercios
Fast forward a few centuries
Grotius, Vattel, Montesquieu
ASYMMETRICAL WARFARE
A Brief History of IEDs

IED: “Improvised Explosive Device,” a bomb composed of any available materials, designed to inflict maximum casualties, typically the weapon of a weaker belligerent used against an invading or occupying force.
So, you don’t like nuclear reactors?

Operation Orchard, 2007
Target: Syrian Reactor, Deir ez-Zor

Operation Opera, 1981
Target: Iraqi Reactor, Osirak