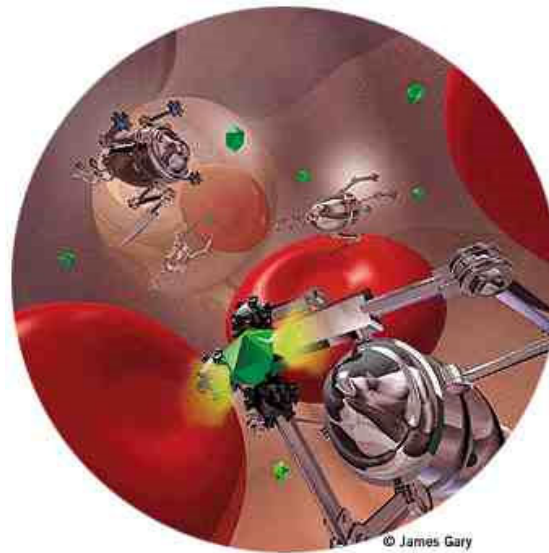
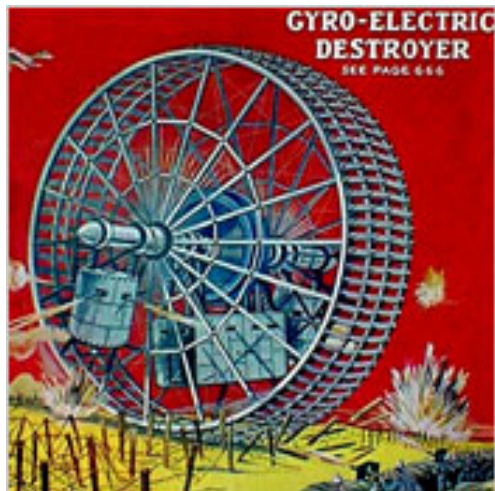
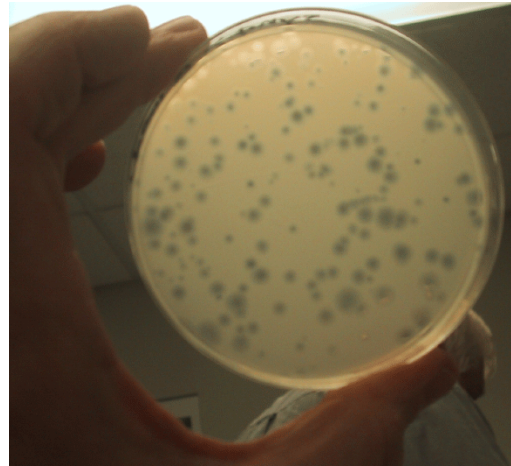
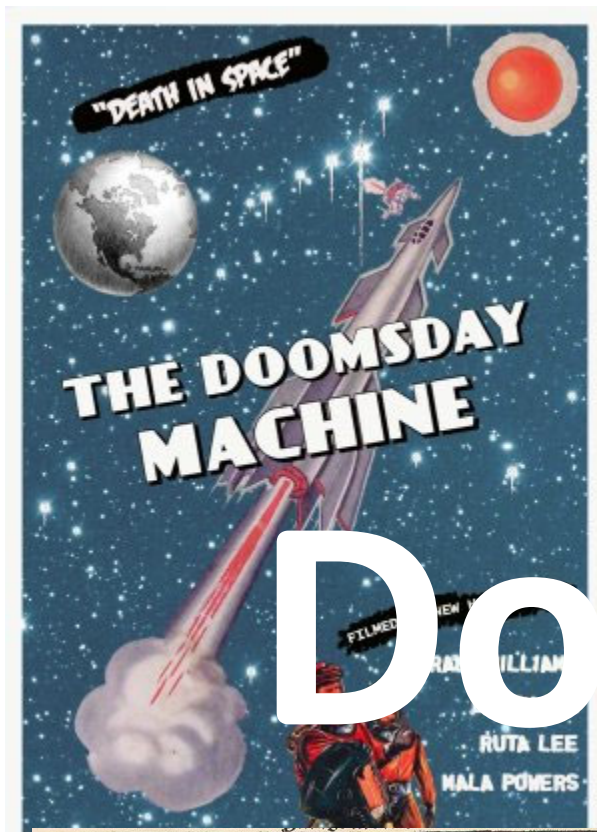


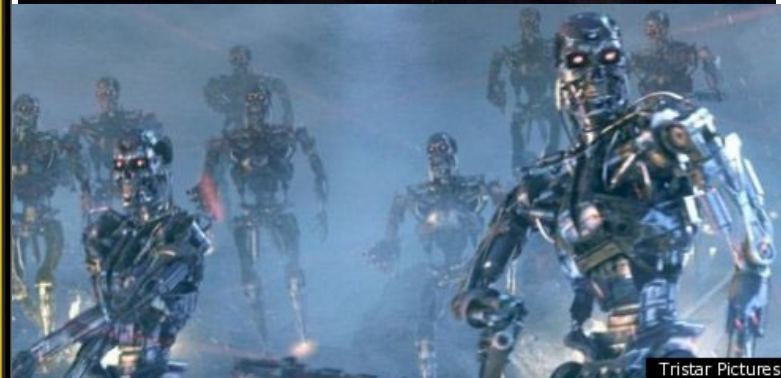
# Anticipating Emerging Threats







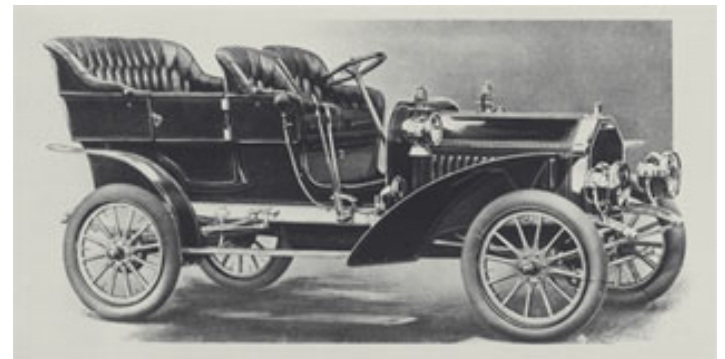
# Doomsday





# Technology Forecasting

- **First order impacts: linear**  
extrapolation – faster, better, cheaper
- **Second and third order impacts:** non-linear, more difficult to forecast
- Analogy: The automobile in 1909
  - Faster, better, cheaper than horse and buggy (but initially does not completely surpass previous technology)
  - Then industrial changes: rise of automotive industry, oil industry, road & bridge construction, etc.
  - Then social changes: clothing, rise of suburbs, family structure (teenage drivers, dating), increasing wealth, and personal mobility
  - Then geopolitical changes: oil cartels, foreign policy, religious and tribal conflict, wars, environmental degradation, and global warming



# Scenarios Method

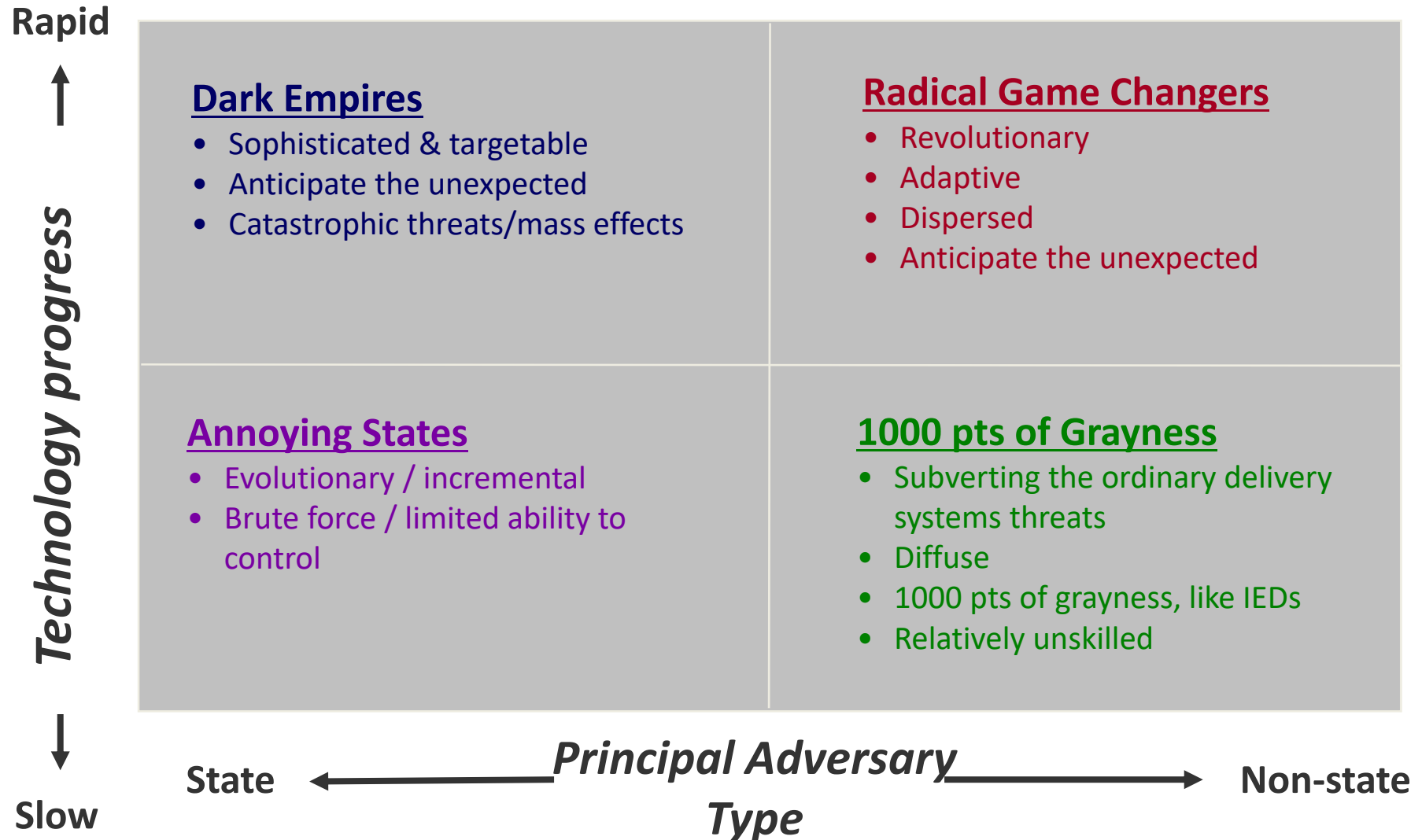
*“The precise definition of ‘scenario’ is:  
a tool for ordering one’s perceptions about  
alternative future environments in which one’s  
decisions might be played out.*

*Alternatively:*

*a set of organised ways for us to dream effectively  
about our own future.”*

# Emerging Tech “Quad” Chart

*Imagine you fell asleep and woke up 25y to one of four “worlds”*



# Scenarios 2030

## **Feral City**

Southwest Asia. Major transit hub of over 30,000,000 people. Massive “Ungoverned Zones” and informal economy. The city erupts into prolonged anarchy amidst sectarian violence. In the chaos, terrorist organizations have created safe zones for the manufacturing of Chem-Bio Weapons. SOF are charged with regaining control of the illicit materials in a hostile and uncertain environment.

## **Trafficking in the Caribbean**

Traffickers from Central and South America are transporting WMD-related materials across the US southern land and maritime border. The sophisticated organizations are increasingly competent at evading detection by US forces and carving out remote local fiefdoms. SOF are charged with rooting out these organizations.

# Feral City

- Paucity of conventional intelligence in a densely occupied/ contested environment
- Hostile non-combatants
- Relevant Technologies
  - Additive Manufacturing
    - Insurgent access to weapons information
  - Machine Learning
    - Tracking conspicuous power consumption
  - Internet of Things
    - Data ingestion/manipulation in an device proliferated environment
  - Directed Energy Non-Lethal Weapons
    - Alternative methods for handling non/semi combatants





# WMD Trafficking in the Caribbean

- Sustained jungle & littoral operations
- Maritime interdiction
- Relevant technologies
  - Metamaterials
    - Technologically advanced 'hide-and-seek'
  - Human Performance Enhancement
    - Special operators excelling in harsh environments
  - Alternative Energies
    - Sustained operations unencumbered by a complex and expensive energy supply chain





# Risk & Threat

**Risk = Probability x Consequence**

**Probability = F [threat, likelihood]**

**Threat = F [capability, vulnerability, motivation]**

# Threat

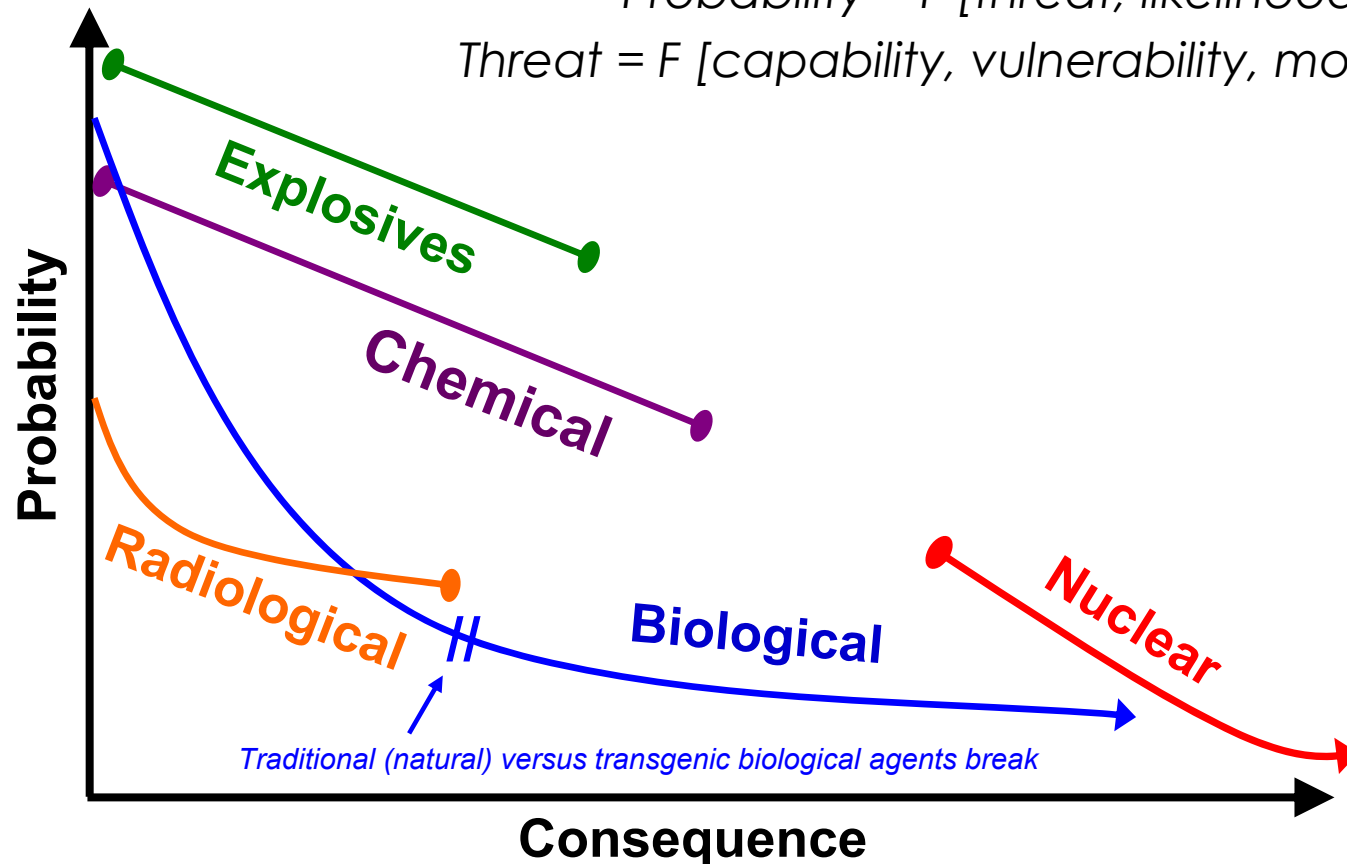
- **Capability** is the **discrete abilities** and **physical items** that need to be brought together to execute an action.
  - Refers to **external** actor
- **Vulnerability** is a measure of the **safeguards** in place to prevent something from occurring &/or for protection, the **ability to respond during** an event, and the **ability mitigate** the effects after.
  - **Internal** actions, i.e., by state, group of people, or individual to whom threat is directed
- **Motivation** is the **impetus** to pursue a specific action. Literally the desire to do something.
  - Refers to **external** actor

# CBRNE Terrorism Risk Assessment

$Risk = Probability \times Consequence$

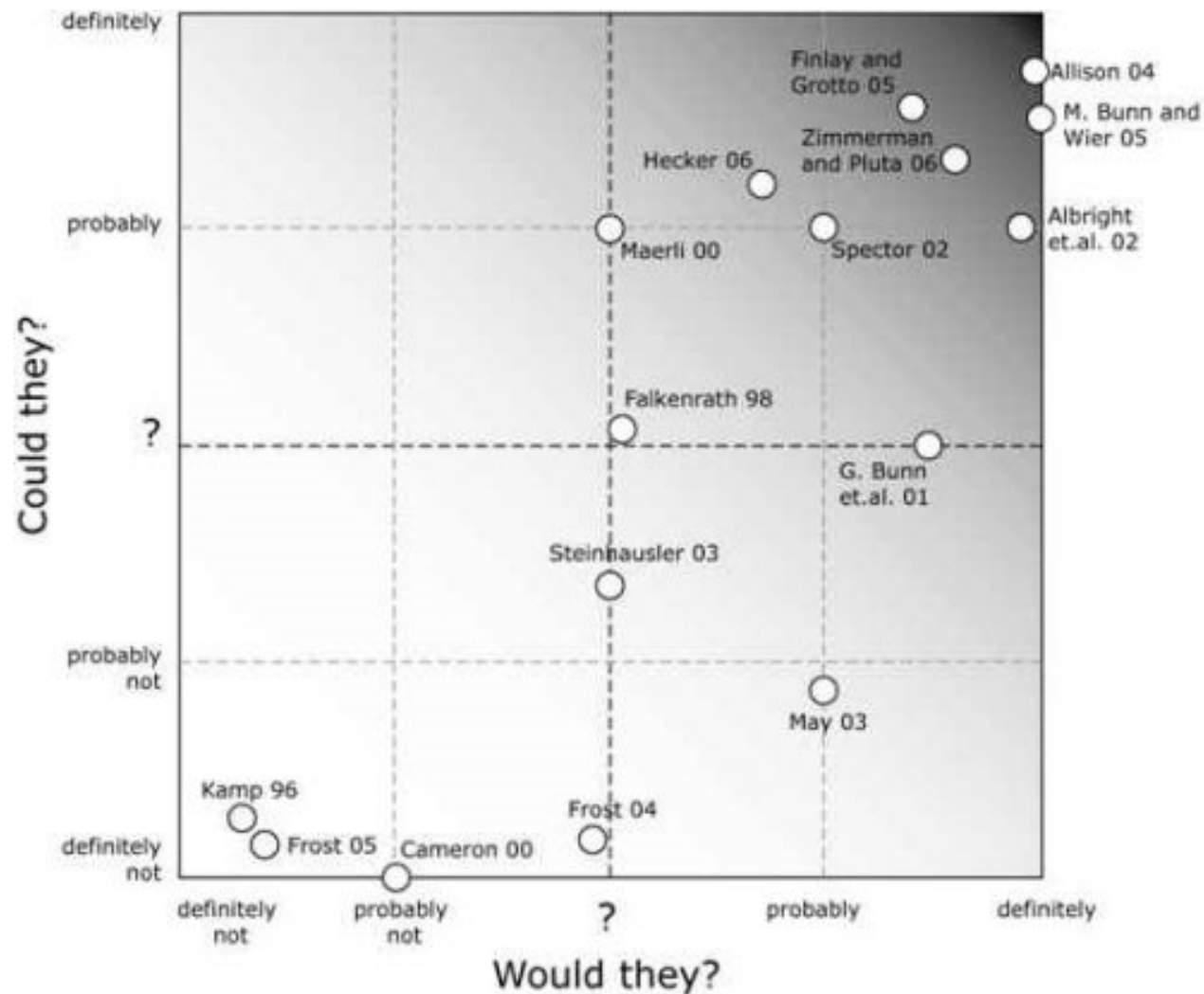
$Probability = F [threat, likelihood]$

$Threat = F [capability, vulnerability, motivation]$



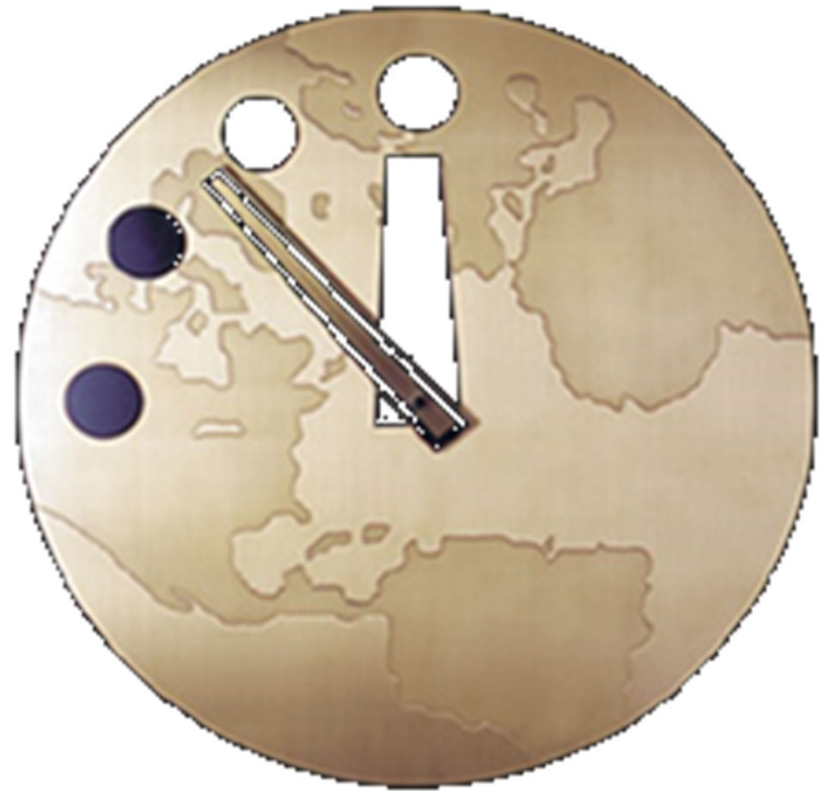


# Nuclear Terrorism Capability vs Motivation



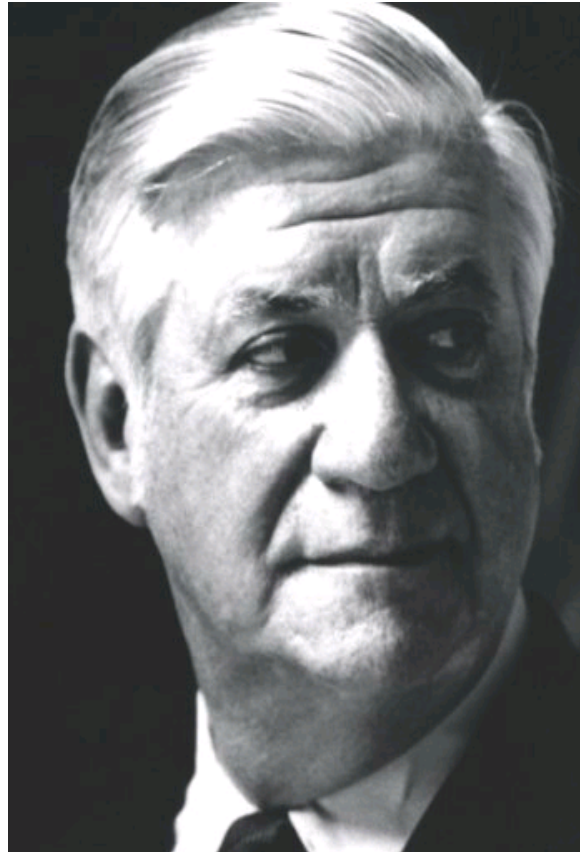
# “Rethinking Doomsday”

- 2010: **Six** minutes to midnight ...
- 2007: **Five** minutes ... Nuclear proliferation/lack of disarmament, **anthropogenic climate change, & biosecurity**
- 2002: **Seven** minutes ... ABM withdrawal, terrorists, little disarmament
- 1991: **Seventeen** minutes ... Strategic Arms Reduction Treaty and unilateral cuts
- 1953: **Two** minutes ... US and Soviet Union test thermonuclear devices



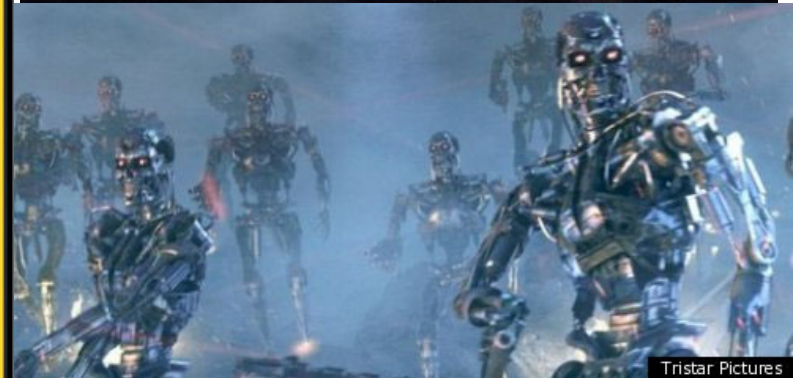
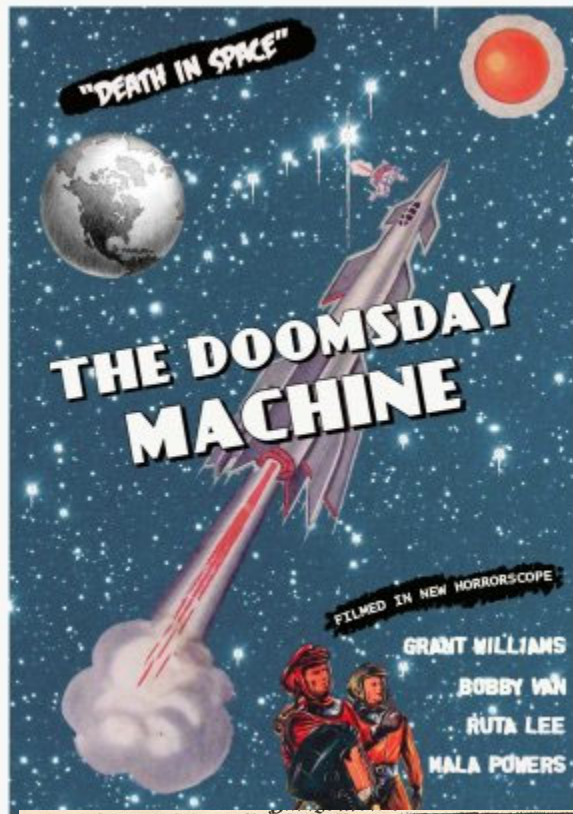
**Doomsday Clock**  
***Bulletin of Atomic Scientists***

# Reconciling Globalization with People ...



**Still true: “All politics is local” ?**





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