DRAFT

**OPERATIONAL WARFARE and COMMAND AND CONTROL
In an
AGE OF ENTROPY**

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Axioms

I. Concerning Resources and Conflict

- **Humans exist in a resource constrained reality or system subject to periodic exogenous change**
  - **Humans require resources to survive/adapt**
  - **All resources are information based**

- **Humans use two methods to obtain resources**
  - **Competition**
  - **Cooperation**

- **Though research has demonstrated that cooperation is more effective, humans tend to compete with each other more than cooperate.**
  - **Possible genetic/evolutionary hardwiring**

- **Competition engenders conflict**

- **Conflict can be peaceful or violent, personal or societal (groups)**
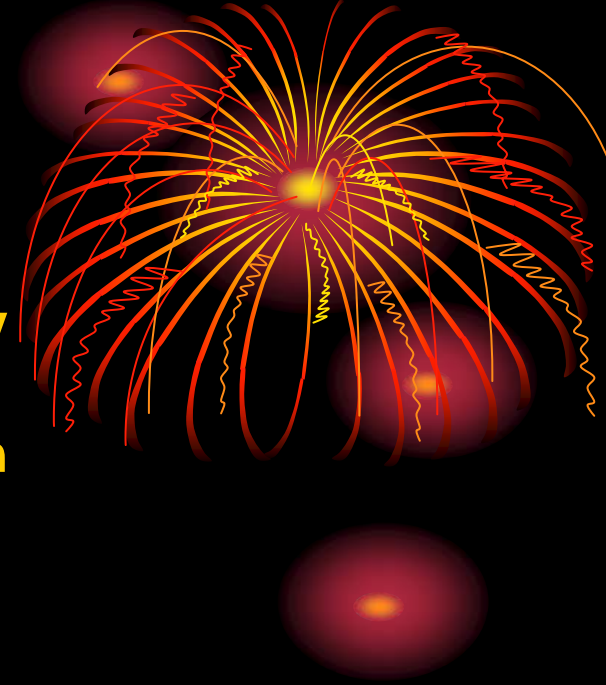
AXIOMS

II. Concerning War and Warfare

- **War is an extreme form of conflict.**
  - **- It is the societal behavior of violence performed for some purpose associated with obtaining resources.**
    - **- It always involves information**

- **War endures and does not change**
  - **- Involves societies (groups)**
  - **- Involves violence (bloodshed)**
  - **- Involves information (resources)**

- **Warfare, the means of war, changes**
  - **- Depends on societies (culture)**
  - **- Depends on tools (technology)**
  - **- Depends on resource constraints (information)**
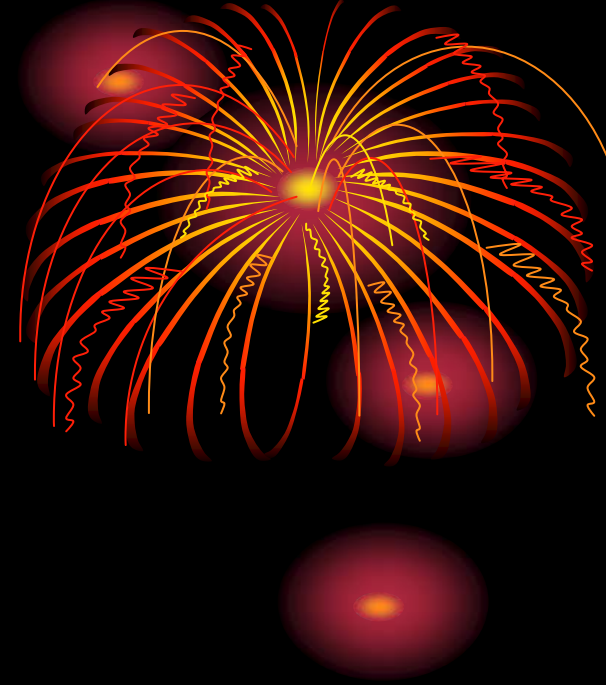
Axioms

III. Concerning Information

- Information is a basic dimension of reality

- Information is completely interrelated with the other basic dimensions of reality:
  - Time $\Leftrightarrow$ Space $\Leftrightarrow$ Mass $\Leftrightarrow$ Energy
  - When manipulated, these produce Force
  - Force produces change

- Information, as with the other dimensions, is subject to the constraints of physical laws. The most relevant of these are:
  - Thermodynamics and Information
  - Incompleteness
  - Uncertainty
  - Systems
  - Complexity

AXIOMS

IV. Concerning Entropy

- **Entropy is the cost of doing business in the universe (reality)**
    - It cannot be ignored
    - It cannot be evaded
    - It can locally be reversed for a short time

- **Entropy affects all dimensions of reality**
    - Space, Time, Energy, Mass, Information

- **Entropy is the amount of dissipated energy that occurs during the production of force or work.**
    - It always occurs
    - The net output is always less than the input

- **Entropy affects information in similar fashion**
    - There always is noise and it cannot be eliminated
    - Received information is always less than transmitted information

- **Entropy is what Clausewitz called friction, only bigger**
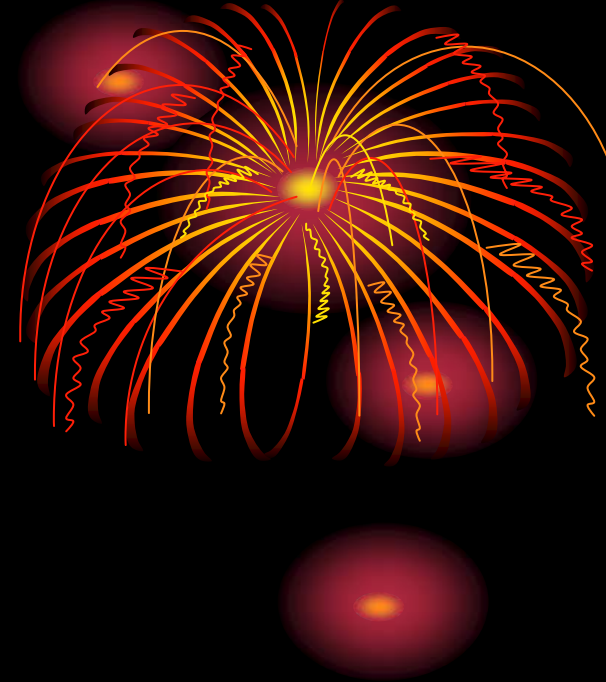
Operational Warfare
Defined

Operational Warfare is a <u>method</u> by which a social group conducts complex military tasks against another social group to achieve some operational objective(s)


- **Method is a system repeatedly converting inputs into operations**
- **Complex military tasks are those sequenced and synchronized actions that make up an operation**
- **Operational objective is strongly related to Strategic Objective and Tactical Objective. It is narrower in scope than Strategic and more complex than Tactical.**
- **Operational Warfare is strongly affected by individuals (leaders), organizations (institutions), culture (doctrine), and technology (weapons).**

Operational Warfare Characteristics

- **The Method applies:**
  - **(Operational) Art**
  - **(Operational) Science**
  - **(Operational) Capabilities**
  - **(Operational) Planning**

- **The Method seeks nothing less than to impose our desired multi-dimensional reality upon the enemy's thru use of Violent Force**
  - **Extreme in-formation of our reality**
  - **Extreme de-formation of enemy reality**

- **To this end, Operational Warfare has six functions:**
  - **Command and Control**
  - **Logistics**
  - **Fires**
  - **Maneuver**
  - **Intelligence**
  - **Protection**

Operational
Command and Control
Defined
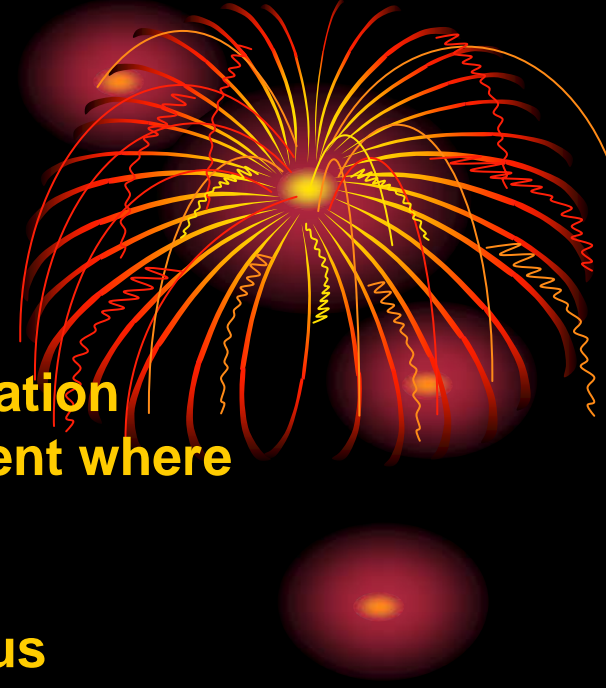
**It is the directed application, adjustment and adaptation
of Operational Warfare to the interacting environment where
friend and foe engage.**

- **Command and Control is the "brain" for conscious
  and autonomic operational warfare functions**
    - **Sensing/pre-sensing**
    - **Processing**
    - **Deciding**
    - **Integrating/coordinating**
    - **Learning**
    - **Cybernetic looping and systems dynamics**
- **Command and Control completely depends on information (management**
- *Command and Control completely depends on entropy (management)*

Operational Command and Control
Entropy Management

- **Must account for system (method) complexity**
  - **Design parameters are:**
    - **Robustness**
    - **Resilience**
    - **Redundancy**

- **Must recognize and include uncertainty and incompleteness**
  - **No plan lasts after first contact with the enemy**
  - **Intelligence always is flawed and will always be so**
  - **Information always is flawed and will always be so**

- **Must account for minimization of maximum loss**
  - ***Not maximize the maximum benefit of the operation***
  - **More structure, more loss**
  - **More time, more loss**
  - **More technology, more loss**
  - **More people, more loss**
  - **More action, more loss**
  - **More energy, more loss**

Implications of Proto-Theory

- **Spend too much effort seeking unattainable perfection**

- **Powell-Weinberger approach better than Expeditionary Warfare**

- **Spend too much on technology that *cannot* work as promised**

- **Do less with less and do less with more; it does not matter**

- **What matters is how to manage the loss (graceful degradation)**
  - **Those who manage loss most "gracefully" will win *always***
  - **Gracefully means robustness, resilience, redundancy**

- **Clarity of End States and Strategic Objectives becomes imperative**
  - **Recognize that even clearest will have ambiguity and incompleteness**

- **Must spend much more on common training and learning – much more!**