



Naval Postgraduate School
Naval Research Working Group

Colonel Jim "Jinx" Jenkins
Science & Technology Division
21 Mar 2016

The overall classification level of this brief is: **UNCLASSIFIED**

We drive the future of the Marine Corps



The Future is now?



Volatile, Uncertain, Chaotic, Ambiguous



The Future is now?

**Complex; Congested; Cluttered; Contested;
Connected; Constrained and Coastal**





What trends will shape the future?

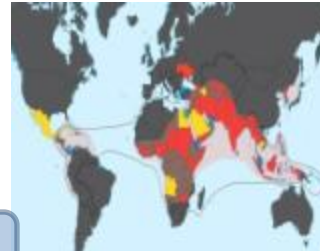
Demographic
Dichotomy



Urban Density and
Sprawl



Uneven Prosperity



Resource Scarcity



Economic/Power
Shift Toward Asia



Blurring Character and
Conduct of Warfare



Struggle for Sovereign
Legitimacy





Military Challenges



Urban Littoral Mega City



IPAD & Google Earth mortar



Anti-Access Area-Denial Weapons



Commercial drones by ISIS & in Eastern Ukraine



Advanced MANPADS employment in Syria & eastern Ukraine



The EF-21 MAGTF

How the Marine Corps will fight



NAVAL

MAGTFs capable of fighting distributed or concentrated in order to achieve overmatch

EXPEDITIONARY

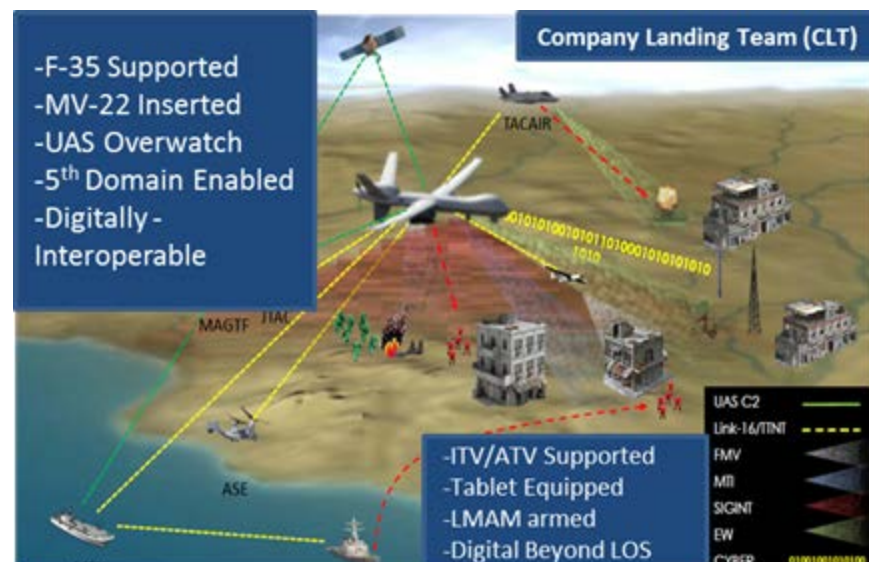
MAGTFs able to rapidly deploy, employ, and sustain in the future operating environment

LETHAL

MAGTFs employ 21st Century combined arms

AGILE

MAGTFs employ 21st Century maneuver to generate combat power overmatch

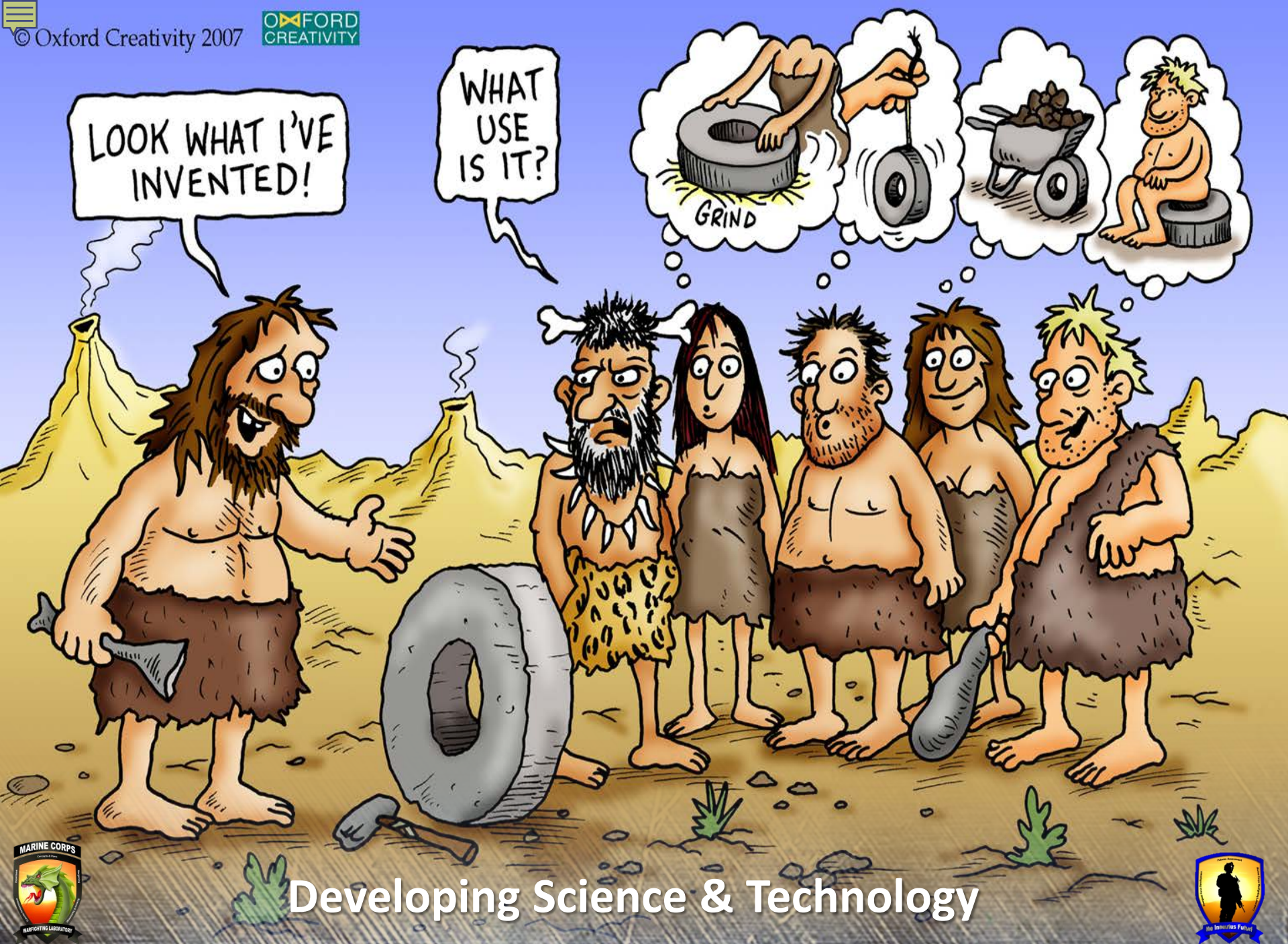




Third Offset



- **Autonomous Learning Systems**
- **Human-Machine Collaboration**
- **Assisted Human Operations**
- **Manned-Unmanned Combat**
- **Cyber and Electronic Warfare (EW) Hardened and Networked-Enabled Autonomous Weapons**





Autonomy

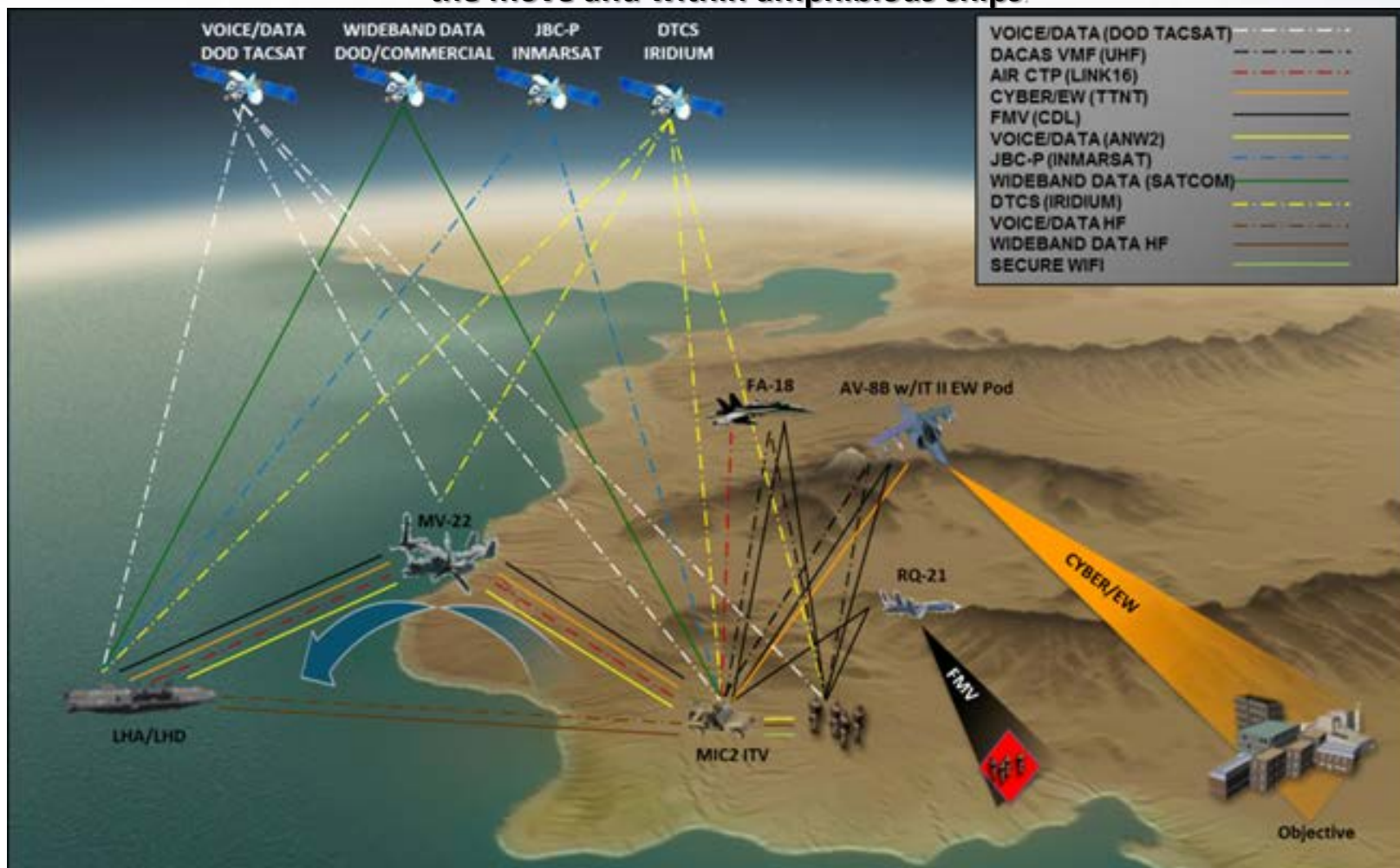




MAGTF Integrated C2:



A black core, service-oriented, IP-based network with open architecture that allows voice, data and full motion video sharing down to the individual Marine and at every level of command. The system will support multiple applications to allow effective awareness and communication across every warfighting function--over the horizon, on the move and within amphibious ships.





Manned-unmanned teaming



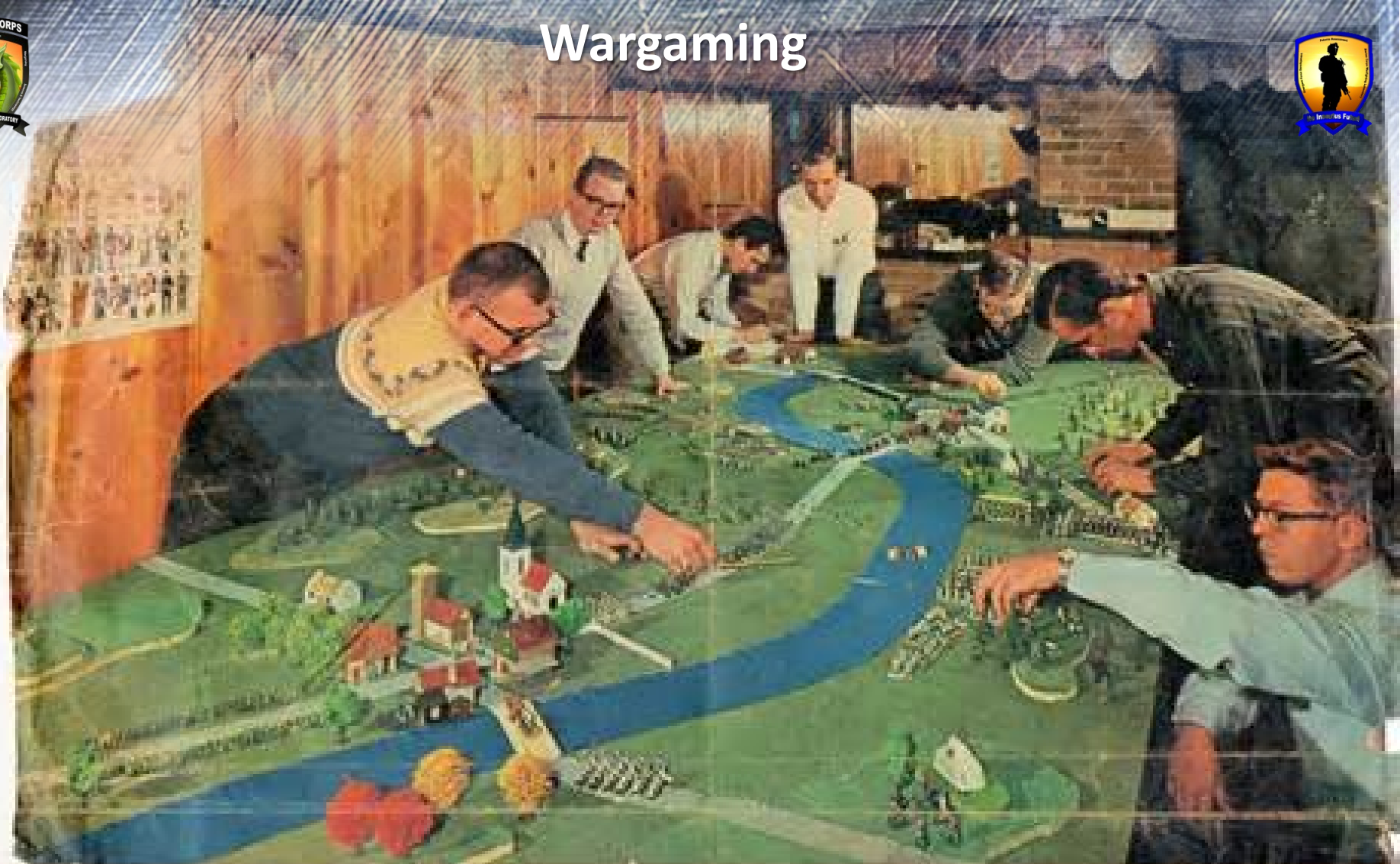


Developing new concepts





Wargaming

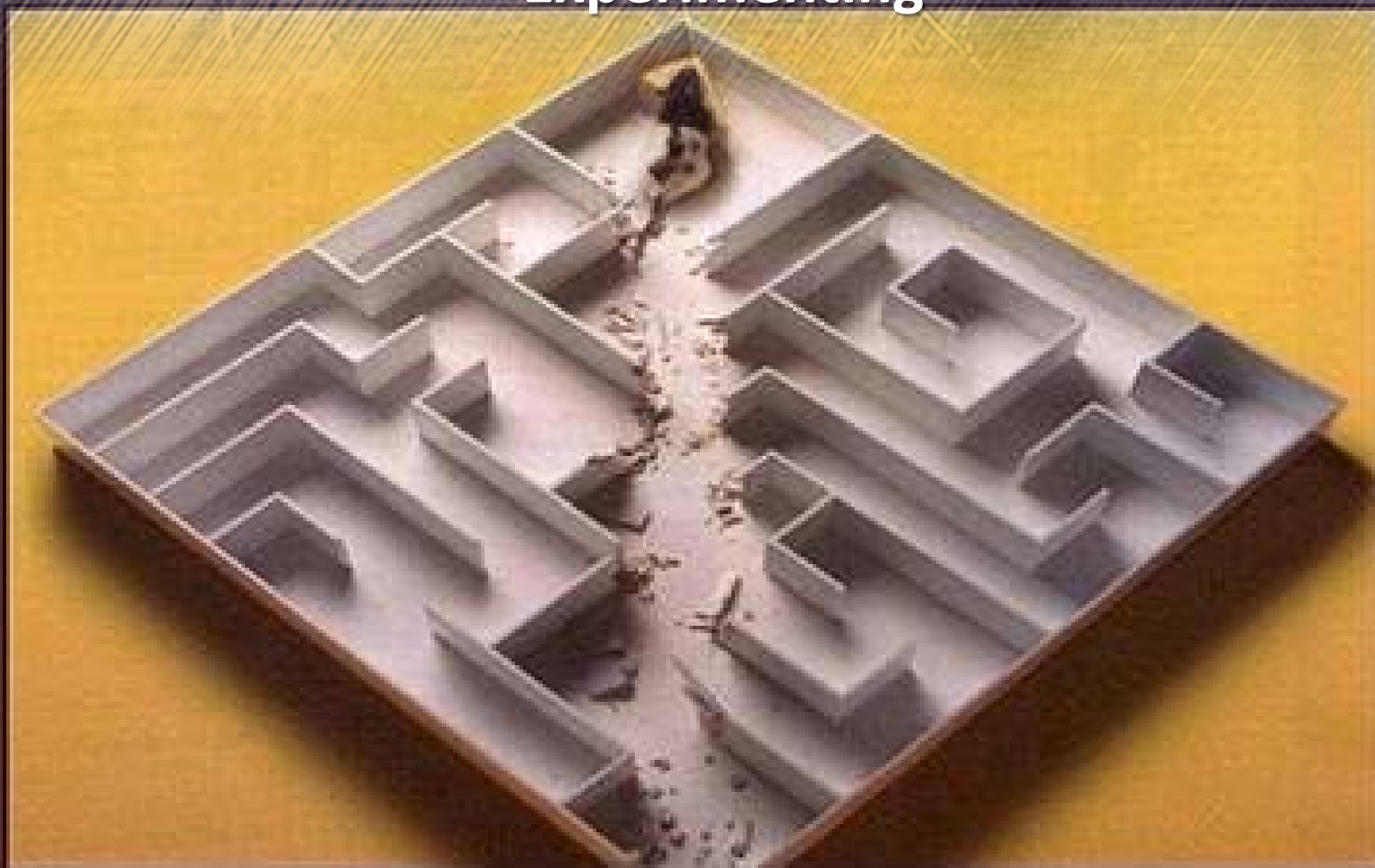


War games enthusiasts of the Twin Cities area move miniature troops on a battlefield set up at the home of a member, David Wesley, 936 W. Hwy. 36, St. Paul. The men are fighting a fictional battle of the Napoleonic period—roughly from 1795 to 1815. "Generals" from left are: Wesley; Curtis Triplett, Cambridge, Mass.; Roy Albard, Minneapolis; Leland Smith, St. Paul Park is military historian, but not a war-gamer; David Arneson, St. Paul; James Clark, Minneapolis; and Winston Scott, St. Paul.

Table-Top 'Generals' Fight Battles With Model Soldiers



Experimenting



US MARINE LOGIC

If you don't understand this,
You've never met Marines...
Why mess with 233 years of success?



Some ideas from the psych major...



- **Enhanced training in the digital age**
- **Signal management/masking**
- **Information Warfare as the 7th warfighting function?**
- **Intuitive robotic control/tasking**
- **Swarms**
- **Modeling cyber/EW effects**
- **Use of AI in wargaming**
- **CUAS / CAI**
- **Sustaining distributed forces**
- **Medical care and human performance improvement for the distributed environment**
- **Personnel management for the robotic MAGTF**
- **Directed Energy on the battlefield**
- **“Apps” for warfighting functions/C2 requirements**
- **Air-launched ISR UAS**



Questions?

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