

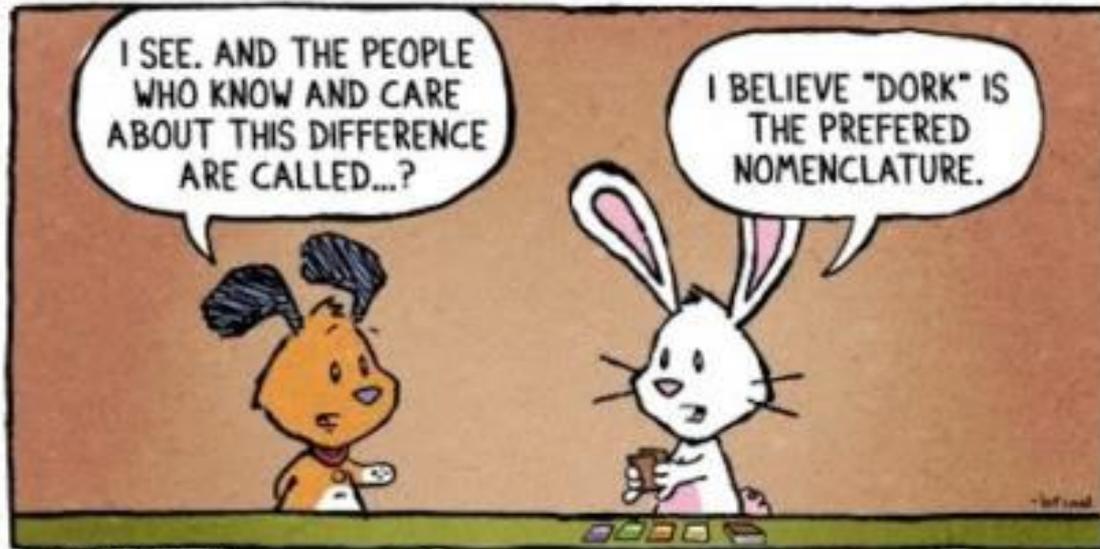
Wargaming and Technology Innovation

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Disclaimer: All the views expressed in this presentation are the personal opinions of the author and do not represent any national, organizational, or institutional endorsement. Those views would be boring.

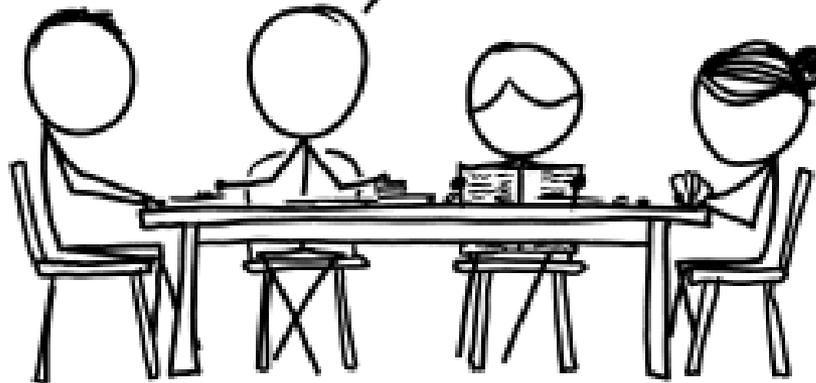
Who am I



You should play more games!!

... NOW, THIS PILE IS "ALLOWABLE DEDUCTION" CARDS. YOU MATCH THEM WITH CARDS IN YOUR HAND TO PRESERVE THEIR FULL POINT VALUE.

OVER HERE ARE "DEPENDENT" TOKENS...



EVERY YEAR, I TRICK A LOCAL BOARD GAME CLUB INTO DOING MY TAXES.

Types of Innovation

“Creativity is thinking up new things. Innovation is doing new things.” — Theodore Levitt

- ***Innovations of kind***

- A **new variety** of thing is introduced that changes an established system.
- A **new system** itself can be established.

- ***Innovations of form***

- An existing thing is **modified to** make it **appeal** to new systems.

- ***Innovations of efficacy***

- An existing thing is **modified to do** the thing it already does **better**.

- ***Innovations of process (interaction)***

- A **new way** for existing things **to interact** is introduced to a system.
- Can be a response to (or consequence of) an innovation of kind, form, or efficacy.

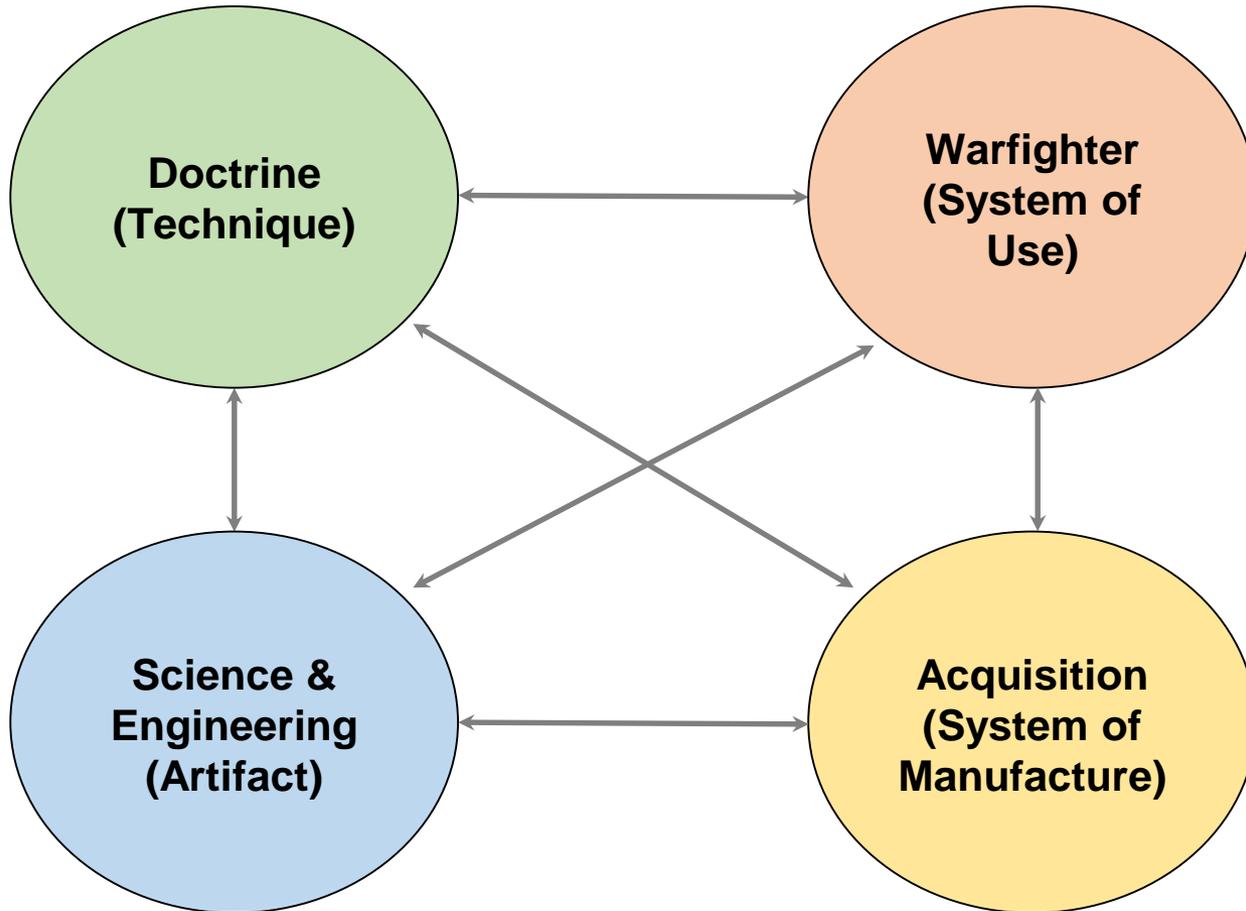
- ***Innovations of principle (conceptual innovations)***

- The existing **pattern of thought** or **theory of action** regarding a system is **changed**.

To be true “innovations” and not just “improvements” requires the system to CHANGE HOW IT BEHAVES.

Components of Technology

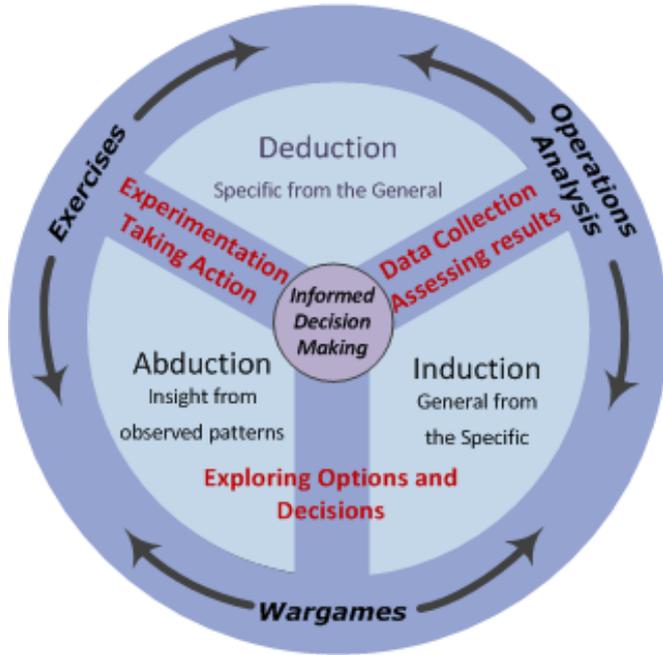
"Any sufficiently advanced technology is indistinguishable from a rigged demo" -James Klass



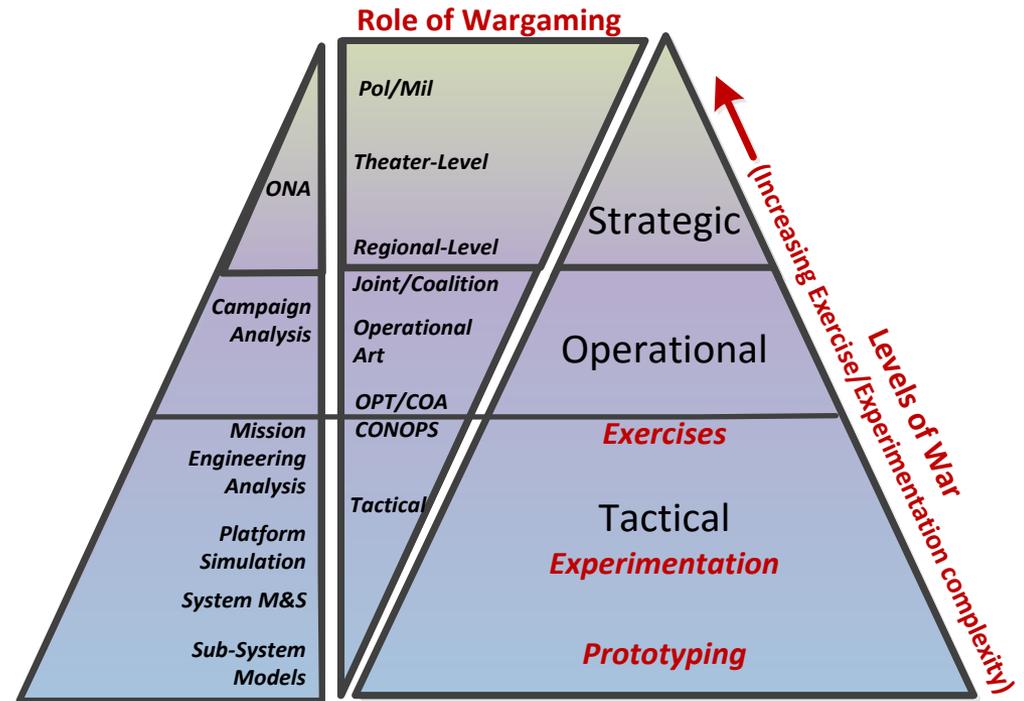
Reference (via Thomas Choinski Connections US 2016 brief "Macro Perspectives on Wargame Culture and Innovation):
Kline, Stephen J. "What Is Technology?" *Philosophy of Technology: The Technological Condition, An Anthology*. Malden, MA: Blackwell, 2003. 210-12.

Operations Analysis and Wargaming: Relationship with Levels of War

"In theory there is no difference between theory and practice. In practice there is." - Yogi Berra
 (well, actually Jan L. A. van de Snepscheut, but you never heard of him...)



Operations Research Cycle
 "Cycle of Research"
 (adapted from Perla, "The Art of Wargaming")



Role of OA

Roles and Relationships
 OA, Wargaming, Exercise/Experimentation

- **Complementary nature of Operations Analysis and Wargaming.**
 - *Where human involvement is held constant, OA is emphasized.*
 - *Where human decision-making becomes dominant, Wargaming is emphasized.*

Wargaming in a “Innovation Campaign” Process

“Time flies like an arrow. Fruit flies like a banana”. - Groucho Marx

- **We need to specify a typology for games that support the “Cycle of Research”.**
 - *Where do various types of games lie between “exercises” and “analysis”?*
 - *What parts of our process are supported by which type of game?*
 - *Stop worrying so much about “what is a wargame” and think about “what kinds of wargames are there?” and “how do I use them?”*

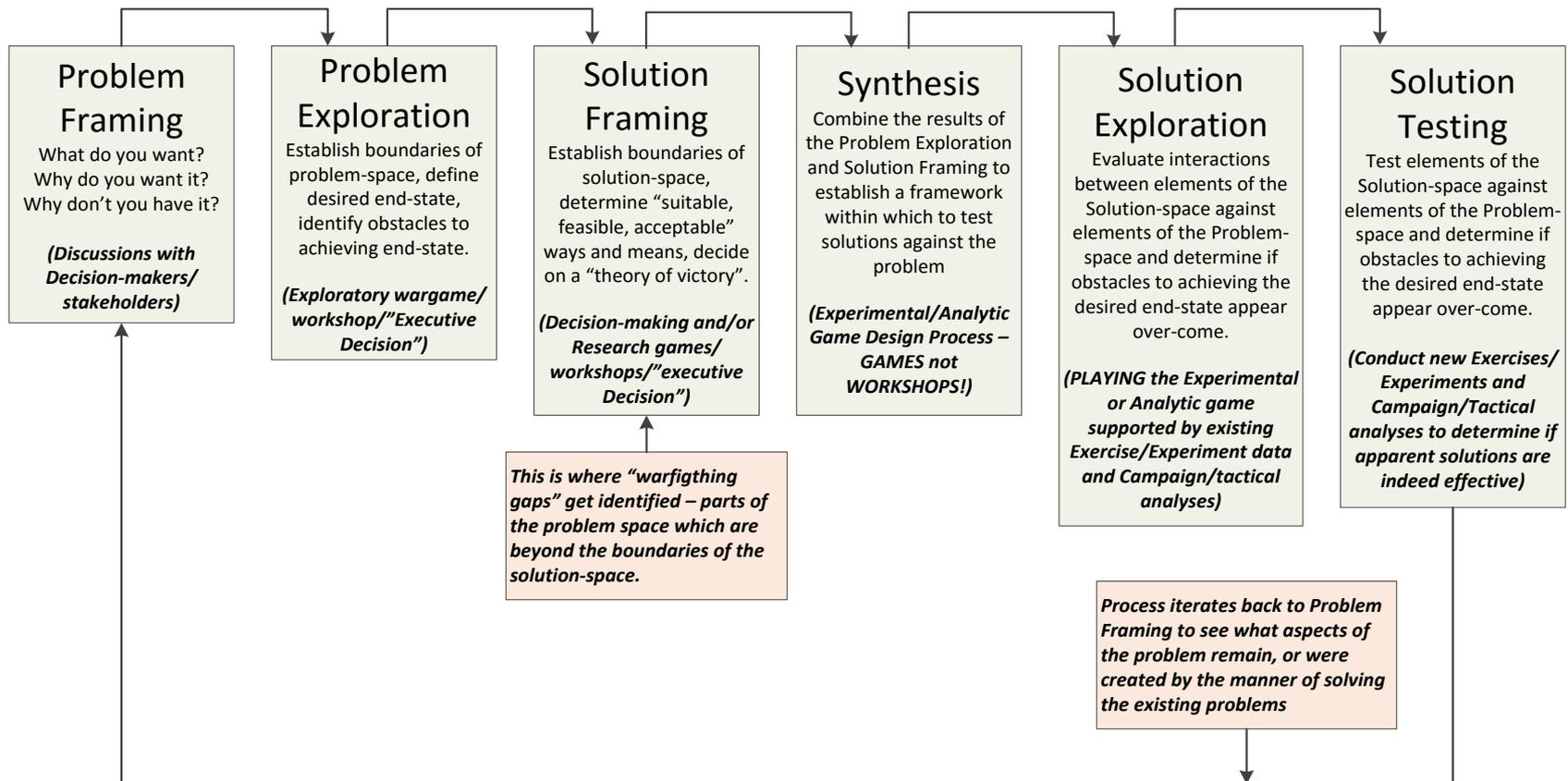


- ***Designing* games teaches us about innovations of kind.**
- ***Developing* games teaches us about innovations of form.**
- ***Strategizing* teaches us about innovations of efficacy.**
- ***Competition* teaches us about innovations of process.**
- ***Gaming* informs us about *how and why* we make decisions leading to the ability to make cognitive leaps – *innovations in principle.***

Interactive Environments for the Time-compressed Collaborative Exploration of Complex and Uncertain Decision – driven Competitive Landscapes (*aka “Games”*)

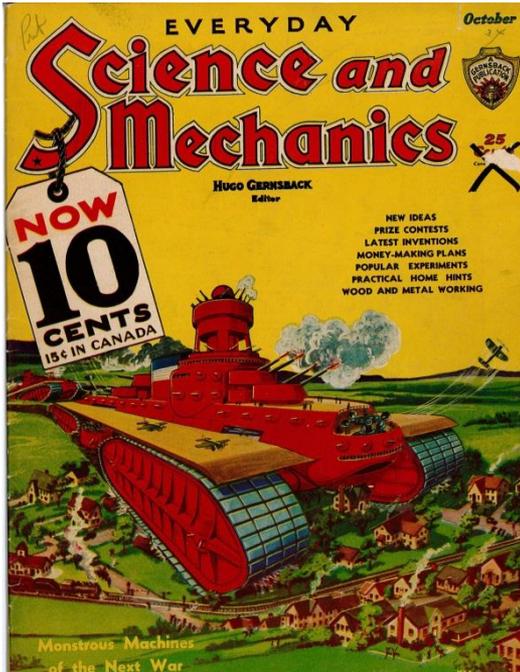
Creativity without strategy is called 'art.' Creativity with strategy is called 'advertising.' -Jeff I. Richards

- **What the heck do I do with all those types of sorts of games??**



Framing the Problem

"I have yet to see any problem, however complicated, which, when you looked at it in the right way, did not become still more complicated." -Poul Anderson

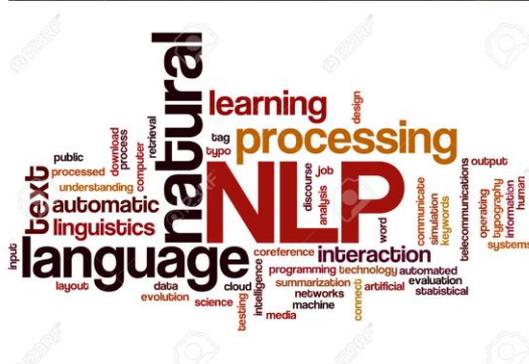


- Downes-Martin: What do I want? Why do I need it? Why don't I have it? (Oh, and when is the sponsor moving to a new job...?)
- Why is (insert new technology here) what we SHOULD use, not just what we COULD use? Is it an answer in search of a problem?
- Does (insert new technology here) actually solve the problem? Create new ones?
- Direct discussion with the sponsor and stakeholders.

Problem Exploration

"There are some people who, if they don't already know, you can't tell 'em." -Yogi Berra

LS Menu 	Wicked questions 	What's debrief 	Min specs 	Heard, seen respected 	What I need from you 	Integrated autonomy
Design elements 	Appreciative interviews 	Discovery and action dialog 	Improv prototyping 	Drawing together 	Open space 	Critical uncertainties
1-2-4-All 	TRIZ 	Shift & share 	Helping heuristics 	Design storyboards 	Generative relationships 	Ecocycle
Impromptu networking 	15% solutions 	25 : 10 crowdsourcing 	Conversation café 	Celebrity interview 	Agree/certainty matrix 	Panarchy
9-whys 	Troika consulting 	Wise crowds 	User experience fishbowl 	Social network webbing 	Simple ethnography 	Purpose to practice



- Bound the Problem.
- Describe desired end-state.
- Identify obstacles to achieving it.
- Leverage non-game related techniques:
 - *"Liberating Structures"* and *"Language Processing"*, *"Slack-storming"* etc.
 - *Workshops, seminar events, and working groups.*
- Exploratory wargames/workshops or "executive decision".

Solution Framing

You can't just ask customers what they want and then try to give that to them. By the time you get it built, they'll want something new. - Steve Jobs

Effects		Conditions	Alternatives
Deter	Escalate		
Deny	Entice	Logistics	UUVs
Degrade	Enhance	Communications	MPA
Deceive	Cue	Command and Control	F/A
Decoy	Attract	Opportunity	Helicopter
Destroy	"Use or Lose"	Flexibility	Large Surface Ship
		Agility	Small Surface Ship
		Endurance	SOF
Effectiveness Criteria			
Suitability – Feasibility – Acceptability			



- **Bound the solution-space.**
 - *Effects overcoming obstacles to success.*
 - *Conditions affecting decision-making.*
 - *Practical Alternatives and concepts for employment.*
- **Theory of Victory.**
 - *Not just “how” to win, but what it means to win and how you decide you have done so.*
- **Decision-making and/or Research games.**

Synthesis (aka “Game Design”)

“If you’ve read it, you’re aware of it. If you can teach it you know about it. But to design a game about it, you need to understand it.” - Me



- **Dialectic process involving Problem-space and Solution-space.**
 - *Dealing with ill-defined objectives, influencing uncertain adversary responses.*
 - *Multi-domain terrestrial, organizational and cyberspace landscapes.*
 - *Adaptation to emergent system behaviors – beyond the boundaries of engineering, modeling and simulation.*
- **Exploratory/Analytic Game design as a method to create the “dialectic arena”.**
 - *Scenarios, Components and Rules establish analog to competitive landscape.*
 - *Game design expertise only acquired with practice designing games.*
 - *Playing a wide variety of games expands the repertoire of a game designer.*

Solution Exploration (aka “playing the game”)

We don't stop playing games because we get old, we get old because we stop playing games –George Bernard Shaw



- **Need a cadre of “game-savvy” operators, engineers and analysts.**
 - *It takes experience for “muggles” to understand the various gameplay roles.*
 - *Just because someone wears a uniform does not mean they can jump right in.*
 - *Leverage gamers already in your ranks.*
- **Experimental/Analytic Games need to be played several times.**
 - *Typical the 1st play teaches the rules, the 2nd play familiarizes the players with strategies and only on the 3rd or 4th play do you get “competitive results”.*

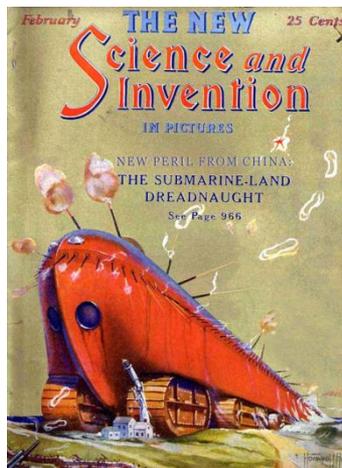
Solution Testing

True genius resides in the capacity for evaluation of uncertain, hazardous, and conflicting information.

- Winston Churchill



- **Drives the rest of the “Cycle of Research”:**
 - *Solutions can be further explored by means of analysis or experimentation.*
 - *Tools can include live exercises, system employment emulation, experimentation within virtual worlds, and constructive simulation.*
- **Cycle will likely need to be iterated several time to find successful solutions.**



In Conclusion...

"A conclusion is the place where you got tired of thinking."

- Harold Fricklestein

Science and Invention in Pictures
Number LXVII - February 1894

The Submarine-Land Dreadnaught

The Chinese government are hoping for a quick delivery, from foreign shipyard, of an amazing new "Submarine-Land Dreadnaught" to combat the Japanese Navy -- see our cover for an illustration of this deadly machine. Delivery was to have been made in December, but will in all likelihood not occur until late in the Spring, due to difficulties in procuring the guns. Standing a hundred feet high, and nearly five hundred feet long, this amazing vessel will be able to travel across the sea-bottom on endless tractor-treads. Its enormous weight of armor and guns prevent any thought of flotation, but will also render it impervious to China's enemies. If the emperor can prolong the war with Japan until this vessel is delivered, via a set of gigantic floating pontoons, his victory is assured.

About thirty guns of 4.7" caliber are fitted around the upper edge of the hull, operated from within the water-proof interior. A further half-dozen larger guns of the latest design are set in barbets atop the hull -- the crew must emerge from within the vessel to load and fire these. Hundreds of Chinamen will serve the guns, maintain the engines, and direct this undersea Behemoth as it traverses the sea floor. A sort of "observation bouy" can be released from within the vessel to ascend to the surface, where it will be towed along by a cable (which also carries a telephone's signals to the crew below).

The system by which the "Submarine-Land Dreadnaught" fires its boilers far below the sea is not yet known. The builders have (as is usual in such cases) proceeded in absolute secrecy to fulfill this contract; the leaders of the nations of Europe are slowly becoming aware of their great manufacturers' mercenary habits.

Back to our Panel Chair...

