Recognizing the Next Rare Event 'Elephant in the Room':

On Better Holistic Assessment and Forecasting of Rare Event Emergence

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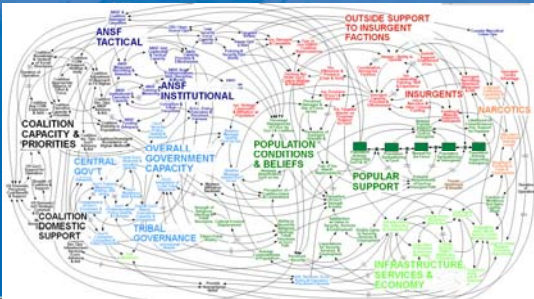
You Cannot Do it This Way (Big Data)!

Or This Way Either (Statistics, Forecast Models and Analytics):
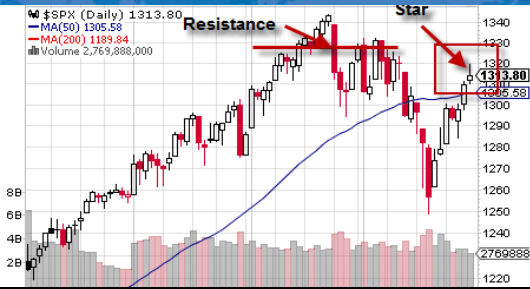
Or This Way (Investigate Individual Cases in Minute Detail):

Or Use Expert's Opinion...

Experts USUALLY miss the boat whenever something UNUSUAL is happening.

When CORRECT, they are NOT believed by mainstream opinion.

Are difficult to select PRE-EVENT.

Evaluating the Apt Visual: An "Elephant in the Room."

- Most Large Scale, Large Impact, Rare Events (LSLIRE) have a long gestation period, then grow slowly.

- They do not often "come out of nowhere."

- Are retrospectively obvious to most people while being ignored by most as they approach.

- Correct Forecasters are SYSTEMATICALLY Ignored.

Best Practice Merges:

- Empirical Data and Experiential Judgment at Multiple Levels (Generic ←→ Specific).

- Idea (Seeing what a thing IS), Information and 'Knowledge of the Field' in which it PLAYS.

- Soft (arts and social sciences) and Hard (technical; physical sciences) perspectives.

Best Practice Uses:

- An Investigative, Contingent, Open Flow and Context-Specific Holistic Mindset.

- Synthetic and Syncretic (changing inflectional forms) observations of change dynamics.

- Mainstream analyst's FAILURE DYNAMICS to notice and to better time LSLIRE emergence.

Some Background Reference Works:

Werther, Guntram; with Thomas Herget. 2013. *Recognizing When Black Swans Aren't*. A Society of Actuaries Monograph.

Werther, Guntram. 2013. *When Black Swans Aren't*. Risk Management & Insurance Review. Vol. 16, No 1. 1-23.

Werther, Guntram. *Iterated Multilevel Thinking for Doing Improved Foresight, Forecasting, and Change Assessment.* Reinsurance Encounters. June & September 2013.

Werther, Guntram. 2013 (0nline)/2014. *Resilience: Its Conceptual Links to Creating Society-Specific Forecasts About Emerging Change*. J. Armed Forces & Society.

Big change ←→ BIG tracks.

- Big picture thinking: "You cannot recognize a rare event if you do not know what normal looks like in each different complex system & among them." Werther 2013.

- Syndromes thinking: embedded-ness, entanglement, emergence, resilience, iteration, are better ways to understand SOCIETAL systems and their BIASED changes than are randomness, chaos or chance.

FIRST FOCUS: Path, Multi-level Thinking and Gaining "Knowledge of the Board."

SECOND FOCUS: Use Systems' Change Dynamics and Judgment ➔ Implications

THIRD FOCUS: Use Mainstream Analyst Assessment FAILURE to Better Recognize & Time LSLIRE Emergence.

WHY THESE FOCI? ➔ THINGS EMERGE IN KNOWABLE WAYS.

Why Focus on Idea, Biased Ways & Deep Knowledge of the Board?

- Of 9-11: "…intelligence is like a fire hose, and you can't get a sip from a fire hose. There was apparently too much for top officials to even read the memos addressed to them." Rowley, June 11, 2013

- " Exclusive interviews show how the FBI bungled its final opportunity to prevent tragedy the first time." Shenon, September 4, 2011

- But Mr. Rick Rescorla "got it"…and was ignored.

- THIS IS NORMAL ➔ How do we USE that to get Better?

Black Swan: What a GREAT Excuse.

- Consider Rumsfeld's known knowns, known unknowns and unknown unknowns…

- VERSUS O'Toole's far less famous "unknown knowns." Wheatcroft , Geoffrey. "A World in Denial of What it Knows" The New York Times, December 31, 2011.

- ➔ It is known, but YOU don't know it.

- The 9-11 Excuse for FAILURE is too much data!

One Proposed Solution is Ever More Data…

- MIT's Pentland says " . . . the challenge is to figure out how to analyze . . . connections in this deluge of data. . . . This means, strangely, that *the scientific method as we normally use it no longer works, because almost everything is significant.*" Pentland, 2012.

- Pentland also comments that 70% of the conclusions in the machine learning literature are wrong.

- "Science advance is often driven by instrumentation. . . . Science is like the drunk looking for his keys under the lamppost because the light is better there" Weinberger, 2011.

Another is to Give Up

- "My whole idea of the black swan is to stop looking for black swans and analyze the fragility and robustness of systems." Taleb in Milner 2012.

- The advice in *Anti-fragile* is to reorganize societies worldwide to benefit from chaos.

- Wow – Good luck with that. Anything better?

So, What is a <u>Real</u> Black Swan?

Hi, I am a Real Black Swan   **But, I'm Real Too**

One GOAL: How NOT to Think About Emerging Complex Futures Like the Turkey Did.

- Avoid single disciplinary explanations ➔ FAIL.

- Foster multi-disciplinary ➔ System's level holistic thinking and "syndromes" views.

- "Officer, he came out of nowhere" ISN'T TRUE

- You DRIVE holistically. Why not assess so?

How NOT to Think About Emerging Complex Futures Like the Turkey Did (2)

- Think <u>WITHIN</u> multiple bias systems (assess multiple different perspectives; <u>internal</u> logics; cognitive system implications; cultures).

- Recognize that this isn't the first time (Use relevant lessons from history).

- But be careful in KNOWING that history doesn't repeat itself (Systems shape-shift; Morph within <u>their</u> bias contexts; Systems ⟵➔ Syndromes thinking).

Another GOAL: Note That Turkey's LSLIRE Was <u>Qualitative</u> too and "In" an Expected Series.

- <u>A Lesson:</u> The farther out on the probability tail, the MORE a <u>Qualitative</u> insight technique helps ➔ Did the turkey notice / ignore near-term <u>farmer/farm operations changes</u>?) ➔ Syncretism.

- <u>A Key Lesson:</u> A broad systems-level & multiple-integrated perspectives view helps illuminate emerging "rare" outcomes. See Andrew Lo. *Reading About the Financial Crisis: A 21-Book Review*. Draft for the J. of Economic Literature. January 9, 2012.

The Turkey's Change Event (2)

- I call this <u>OPEN</u> <u>FLOW</u> thinking process "Folding In" / "Layering the Onion", and it is essentially PASSIVE with regard to information flows. [Example: Officer/wife]

- This is NEVER a closed model thinking process.

- It is also NOT random, unknown, or "extreme" ➔ You are always grounded within a change processes focus and are especially focused on watching for <u>changing forms</u>. This is the nature of <u>syncretic</u> thinking.
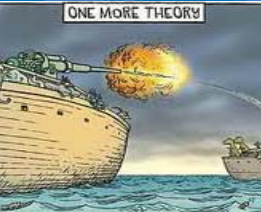
Understanding Connected Orders is Necessary for the Better Forecasting of LSLIRE's

Advanced Technology Prevails

ONE MORE THEORY

Most Rare, Large-Impacts, Large-Consequence Events Are:

- Emergent.

- Entangled.

- "New" Syndromes of Complex Adaptive System's Changes.

- Shape-Shift like Old Water Flowing in New Banks. Tocqueville, Alexis

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Here are Some Characteristics of Excellent Normal Event Forecasting

- Age ➜ One of the few things that gets better.

- Psychological-Cognitive Foci ➜ multiple perspectives, multi-level thinking, iteration, socio-psychological grounding.

- FIND, don't predetermine relevant to context variables and information ➜ Investigative mind.

More…

- Things exist in contexts, and are not "free."

- See the "Fit" of things and BIASED potentials, limits, possibilities & impossibilities.

- Multiple experiences and jobs.

- Skepticism and contrarian pose.

Excellent Normal-Range Forecasters are:

- Patternists: See patterns of information.

- Specific context focused (beyond statistics).

- Grow "antennae" ➔ insight, intuition, synthesis ➔ "knowledge of the board."

Crisis (LSLIRE) Foresight is About:

- Using multiple arrayed methods and their FAILURES positively. Using triangulation and pattern emergence via folding in, etc.

- The ERROR term of each method is the most interesting. Methods that measure normal events fail in abnormal forecasting.

More…

- Use Qualitative insights to foresee change lacunae.

- See under-girding socio-psychological and style changes ➔ implications.

- See how things are embedded, entangled, and emergent.

We can USE the Fact That Most Analysts are Not Good at This.

- Analysts and their analytical organizations are very herd-like; especially mainstream ones.

- ODNI = 1.5 / 5.0 (5=synthetic thinker) quality for synthetic thinking ability of analysts.

- "The Model is an Adjunct to the Analyst" Ilchinski

- WHY? = Extant Methods work… "until they didn't." Kutner 2011.

Emergence: LSLIRE Events Normally Come From Somewhere.

Predator Drone – A Technology Advance for Governments…

Meet Mr. Maynard Hill (A Nice Old Gentleman with a Hobby)

"Enabling Technologies" arise amid Particular Social Realities ➔ Morph into Enabling a "LSLIRE." Kurzweil 2007

Mr. Hill Flies a Model Across Atlantic Ocean

A Not-So-Nice Man Tries to Fly a Model Aircraft Into the Pentagon

Benbecula: 12:44 UTC 21 August 1998
3270 km
26 h 45 min
Bell Island: 09:59 UTC 20 August 1998
Flight Track of Aerosonde "Laima": t Robotic Aircraft to cross the North Atla

Early Elephant tracks…Multiple LSLIRE's Arising?

Hezbullah Drone over Israel

GPS – Fighting for Resources

How Long Before…

Entanglement: Systems are Not Free

We Always Build the Future…

Via Old Water Flowing in New Banks
Tocqueville, Alexis de (Letters)

Kenyan DEMOCRACY Must Prevail Now!

Syndromes Shape-Shift to "New" Syndromes ➔ Entanglement Offers Core Lessons About How.

- Limits the likely paths of an emerging change?

- Insight into what can be, and can never be.

- Offers insight into direction of coming change.

What if Not Free, Not Determined: Being Entangled & Emergent

- String, Thread, Path, Way, Play... Kant, Confucius, Hayek & Classic Thinkers

- "You think of me as one who studies many things and remembers them, don't you? It is not so...There is one thing I use to string them together." Confucius.

- It is NOT about the Data or Information, and surely not about Storing it all.

Human Events are NOT Random, Chaotic, Atomized....

- "...Thus gradually more and more clearly defined tracks arise and come to be used to the exclusion of other possible ways." Hayek.

- Some thinkers focus on each "themed play."

- Others on each as "Idea" and its implications.

In any event, it is "When in the Course of Human Events" Thinking

NOT, when Random Stuff Happens.
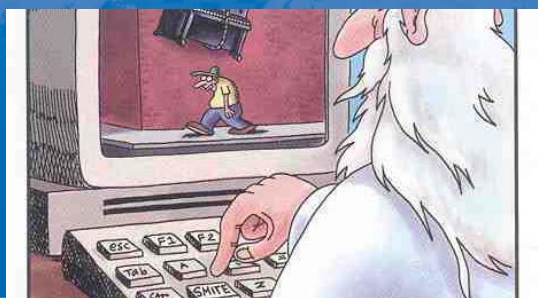
LSLIRE Foresight is Largely Qualitative Thinking

- We need to integrate that into QUANTITATIVE method's success and their failure dynamics.

- We also need to address the QUALITATIVE weakness as to seeing TIMING of emergence.

- We need to ITERATE among both to foresee syncretism (changing forms).

Why Most "Scenarios", AI, Models, and Learning Agents Fail.

- Retrospective (hindcasting) mindset.

- Fail to link the <u>internals</u> (Cognitive bias; shifting norms) of change to externals.

- They often fail to see the specifically "themed play", which is a qualitative aspect of change.

Foreseeing Rare Event Emergence & Entanglement is Largely About:

- Understanding Shifting Contexts ➔ Profiling the Change Processes of a Biased System.

- It is Specific, and not Generic or Universal. Statistics are by their nature GENERAL truths.

- No Solely Arithmetic Approach Can Capture This Kind of Dynamic, Individual Themed Play.

BECAUSE THEY NORMALLY FAIL, We Focus on Herd-like Mainstream Analysts, NOT Correct "out" Analysts.

- You rarely know, pre-event, who WILL BE correct.

- Being a good forecaster in one context is no guarantee of being correct in other contexts.

- It is harder to statistically evaluate broadly divergent "out" / correct analyst opinion.

- That the mainstream misses LSLIRE's is one stable thing we can count on.

GOAL: Link LSLIRE Timing to the Fact That Herd-like Analysts Are Bad at Synthesis/Syncretism.

- GOAL ➔ Better see the timing of an emerging and entangled LSLIRE change?

- TRIGGER IDENTIFICATION ➔ How can we better foresee trigger (syndrome change) points using variously great⬅➔average⬅➔ clueless MAINSTREAM analysts?

Using Mainstream Analyst Dissonance

- Used "a homogenous group is terms of financial reporting" Park and Xie 2011, 7.
- Noted "The market makers and analysts had informational problems…during the unstable economic period" (2005-2008) not before. Sojung Park and Xie 2011, 26-27.
- Noted "….the market did not view structured bonds as opaque assets before 2005."

Using Analysis Dissonance (2)

- Results ➔ Just prior to the LSLIRE, the mainstream analyst ratings diverged significantly (their herd-like behavior declined) as they could no longer all see the same play.

- Even if NONE were correct, we have a timing tool that can be integrated with QUALITATIVE.

Timing the Arab Spring?

- "Our methods worked until they didn't." Israeli Consul Kutner of Philadelphia, May 17, 2011.

- Most analysts thought <u>known</u> conflicts could be contained, as they previously had been.

- Were there increased mainstream analyst dissonances?

More Broadly ➔ Arrayed Model Use

- Among model ARRAYS quantitative dissonances – crazy readings in some, divergence in some, not others provide an analogue for individual analyst evaluation dissonances just prior to an LSLIRE emergence. Werther 2008;

- This works best when specific to context arrays are used for each targeted system. Werther 2008

LESSON: The QUANTITATIVE Indicators Increasingly Don't "Make Sense" within the Logic of Models

- We can use this insight to time "Rare", "Large Impact" "Large Consequence" emergence.

- No straight-forward "Big Data" or "Total Information" approach will help here. Making sense of the patterns is the problem. Pentland

- Linking to SYNCRETIC qualitative THEMES will.

Reduced "black swan" ➔ LSLIRE

- We might be wrong ➔ The LSLIRE may not emerge.

- We will not be clueless ➔ Living in Yellow (situational awareness).

- At post-LSLIRE, iteration of qualitative and quantitative methods works to foresee "new normal" emergence.

- Recall the entanglement and RESILIENCE lessons ➔ "Old water flowing in new banks." Tocqueville; Werther 2013.

A Closing Comment on Twin Perceived "black swans" from an "out" analyst.

- WHO said this and WHEN?

- Expressed concern that the government "...drowned the [his] country in a sea of debt..." Berner 2006, 23

- The U.S. "...economy can easily collapse...the very flaws of the...fiscal system are becoming its own noose." (Berner 2006, 105, 169).

Check Out Proposed Defense Spending and 2013 U.S. Political Polling.

- UBL's strategy "of hitting the U. S. economy by all possible means" included getting the U.S. stuck in foreign entanglements such as Afghanistan and Iraq so that the U.S. will in the future focus domestically. (Berner 2006, 171)

- "If their economy is destroyed, they will be occupied with their own affairs" (Berner 2006, 118-119).

The Mainstream Analyst Community…

- Said they missed 9-11 (and much else) – Black Swans – because of too much information. The world is too complex to predict, random, chaotic world, etc.

- Yet often, people with far less data and far better understanding "got it." STUDY HOW!

- Thank You -

Any Discussion?