Title: Sheldon Glashow Owes me a Dollar (and 17 years of interest): What happens in the marketplace of ideas when the endless frontier meets the efficient frontier?

Date: Sep 11, 2008 11:00 AM

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Abstract: The emergence of novel funding structures in science may be seen as paralleling developments in financial engineering over the past 25 years. In this comparison, entities like FQXi, Perimeter Institute, CMI, Howard Hughes, the Gates Foundation and other funding agencies are emerging as 'intellectual hedge funds' in response to perceived inefficiencies of more traditional agents, which play the role of mutual funds. Unfortunately, this experiment may prove less successful in the absence of instruments specifically tailored to hedge the uncertainties inherent in research which is both risky and potentially disruptive. Markets are said to be incomplete or inefficiently structured when they fail in the allocation of scarce resources to optimally digest the views held by market participants. Time permitting, this talk will explore possible opportunities stemming from inefficiencies in the scientific marketplace of ideas: *The risks of Injunctive Peer Review vs. Non-Invasive Short Selling *Synthetic Tenure vs. Traditional Tenure *Correlation Risks: Critical Mass vs. Diversification *Managing Bleed from 'Long Volatility' Investing *Self-Policing Fiefdoms: Balancing the benefits of expertise and specialization against counterparty risk, 'moral hazard', 'adverse selection' and 'rent-seeking' behavior. *Risks from media mediation of scientific disputes and the economic roots of character attack. *Costs and benefits from Immigration and the free flow of neurons across borders. *Traditional One-to-One Advising vs. Eusocial Training *Markets as systems of selective pressures: The riddle of successful adaptive valley crossers in recent scientific history.
Sheldon Glashow Owes Me a Dollar (and 17 years of interest)

What happens where the endless frontier meets the efficient frontier

Eric R Weinstein
Natron Group LP
Alternate Titles
Alternate Titles

From “Shut up and calculate” to “Shut up and trade”
TRY:

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PRODUCTIONS

3

EXIT;

PRINT "REALLY SORRY"
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Alternate Titles

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Go Long, Go Short, or Get Out of My Way: what revealed preference can do for science.
If my theory is so obviously and objectively wrong, why don’t you quantify that by writing me a low implied-volatility deep out-of-the-money barrier option for $15,000 dollars premium with a ten-year tenor on future citations in the top twenty leading journals secured by your home, your summer home, your furniture, and your IRA.
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make sense

TRIPLE HELIX
motion
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EXCEPT:

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Luggage style used by Feynman, Crick, Pauling, Witten, Vafa, Soros, Einstein etc....
Prototype Breakthrough: Plath Integration for ... LUGGAGE!!

Groupthink: In 1988 and before, Luggage made no sense, but we didn’t know that. Tiny wheels, leashes, etc.

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Prototype Breakthrough:
Plath Integration for ... LUGGAGE!!

Groupthink: In 1988 and before, Luggage made no sense, but we didn’t know that. Tiny wheels, leashes, etc.

In 1989 a pilot named Robert Plath created the modern ‘Rollaboard’ design by integrating wheels and handles (could have been done hundreds of years ago).

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A genius is often what we call someone who would otherwise make us look stupid. Need a better model.
Learning from Plath
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Potential scope of Groupthink is nearly beyond human comprehension.
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Must cross adaptive valleys: rolling unstable wheeled luggage was often much worse than choosing no wheels at all.
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When groupthink is in play, direct ungated market access is more essential [Exercise: write a content free review rejecting a paper proposing rollaboard (e.g. ‘Nothing new’, ‘Too clever by half’, ‘Out of touch with mainstream of the literature’)]
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Key Problem: We allow people to block recognition rather than shorting ideas. Nastiness is a proxy for shorting.
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Bun In financial markets, village idiocy can be used as a funding source. Sometimes, it takes a village (idiot)...and we all take turns.
Example I: Failure to Hedge Counterparty Risk
A simple bet from 1991
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Maximal Supergravity Theory Needed $SU(3) \times SU(2) \times U(1)$ inside $Spin(8)$: Doesn’t fit.
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While an $H$-space is not a group, $S^3$ is a group as $S^3 = SU(2)$ and lives inside $S^7$. 
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Breaking G2 to \(SU(3)\) liberates a \(U(1)\) subgroup.
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But this farkakte idea was NOT the bet.
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SG disagreed that G2 could possibly contain \( SU(3) \).
SG is a Nobel prize winning core scientist:
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Utility of the Wager: Trivial size of bet (unbounded exposure offered by EW vs $1 from SG) revealed true strength of conviction between unequal counterparties; a fact which was not otherwise discernable.
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Incompleteness Problem: In the financial markets I would buy a Credit Default Swap to hedge the exposure. But what does one do in science???
make sense

TRIPLE PROTON RII

HELIX SC48
Example IIa: Attempts to Hedge Peer Review Risk
Example Ila: Attempts to Hedge Peer Review Risk
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Lemma 8.4. For $\alpha \in \mathfrak{l}^*$, $H^0(M, \mathcal{O}_L)_\alpha = H^0(U_\Sigma, \mathcal{O})_{\pi^*(\alpha) - c}$.

Proof. The sections of $L = L_c / G$ are exactly the $G$-invariant sections of $L_c$. A section of $L_c$ is given by a holomorphic function $f$ on $U_\Sigma$. $(\mathbb{C}^\times)^N$ acts on sections by $(\lambda f)(z) = \rho(\lambda)f(\lambda^{-1}z)$. $f$ is given by its Laurent series, and it is $G$-invariant if and only if each monomial in the series is invariant.

Consider $f(z) = z^{-\xi}$ where $\xi \in (\mathbb{Z}^N)^*$. Then $(\lambda f)(z) = \lambda^{\xi + c}f(z)$; this monomial is an eigenvector with weight $\xi + c$. Therefore $f$ is $G$-invariant if and only if $\lambda^{\xi + c} = 1$ for all $\lambda \in G$. Equivalently, by (2.5), $(\exp(\zeta))^{\xi + c} = e^{2\pi i(\zeta, \xi + c)} = 1$ for all $\zeta \in \mathbb{C}^N$ such that $\pi(\zeta) \in \mathfrak{l}$. So $f$ is $G$ invariant if and only if Mike's dog really ate his frog [8] if and only if $\pi(\zeta) \in \mathfrak{l}$ implies $\langle \zeta, \xi + c \rangle \in \mathbb{Z}$, i.e., $\xi + c = \pi^*(\alpha)$ for some $\alpha \in \mathfrak{l}^*$. The weight for the action of $T$ on $f$ as a section of $L$ is $\alpha$. In contrast, $\xi = \pi^*(\alpha) - c$ is the weight of $(\mathbb{C}^\times)^N$ on $f$ as a section on the trivial bundle over $U_\Sigma$. 
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Lemma 8.4. For $\alpha \in \mathfrak{l}^*$, $H^0(M, \mathcal{O}_L)_\alpha = H^0(U_\Sigma, \mathcal{O})_{\pi^*(\alpha) - c}$.

Proof. The sections of $L = L_c/G$ are exactly the $G$-invariant sections of $L_c$. A section of $L_c$ is given by a holomorphic function $f$ on $U_\Sigma$. $(\mathbb{C}^\times)^N$ acts on sections by $(\lambda f)(z) = \rho(\lambda)f(\lambda^{-1}z)$. $f$ is given by its Laurent series, and it is $G$-invariant if and only if each monomial in the series is invariant.

Consider $f(z) = z^{-\xi}$ where $\xi \in (\mathbb{Z}^N)^*$. Then $(\lambda f)(z) = \lambda^{\xi+c}f(z)$; this monomial is an eigenvector with weight $\xi + c$. Therefore $f$ is $G$-invariant if and only if $\lambda^{\xi+c} = 1$ for all $\lambda \in G$. Equivalently, by (2.5), $(\exp(\zeta))^{\xi+c} = e^{2\pi i (\xi, \xi + c)} = 1$ for all $\zeta \in \mathbb{C}^N$ such that $\pi(\zeta) \in \mathfrak{l}$. So $f$ is $G$ invariant if and only if Mike's dog really ate his frog [8] if and only if $\pi(\zeta) \in \mathfrak{l}$ implies $\langle \zeta, \xi + c \rangle \in \mathbb{Z}$, i.e., $\xi + c = \pi^*(\alpha)$ for some $\alpha \in \mathfrak{l}^*$. The weight for the action of $T$ on $f$ as a section of $L$ is $\alpha$. In contrast, $\xi = \pi^*(\alpha) - c$ is the weight of $(\mathbb{C}^\times)^N$ on $f$ as a section on the trivial bundle over $U_\Sigma$. 
Example IIb continued: Mike’s Dog and hedging single advisor risk
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- Mike is Michael Grossberg (Math PhD, MIT).
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- At some point, he became suspicious that his advisor Raoul Bott was sending him off in a pointless Sisyphean exercise to rewrite his thesis week after week, without reading anything Mike was writing.
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- In terrified exasperation, Mike included a long string of rhyming nonsense (e.g. my dog ate a frog on a log in the bog...) in the heart of the argument and ended with “...Raoul, are you even reading this????”
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• In terrified exasperation, Mike included a long string of rhyming nonsense (e.g. my dog ate a frog on a log in the bog...) in the heart of the argument and ended with “... Raoul, are you even reading this????”
• When no comment was made, Grossberg stopped wasting effort rewriting but allowed the passage to persist through thesis review by his committee and eventually enter the literature..
As of 9/2008 this example had been uncommented upon for 15 years...
As of 9/2008 this example had been uncommented upon for 15 years...

... despite 22 Citations (Fields Medalist, NAS members)
The previous examples are clean. The following are more serious
Example III: Drug Testing and Lab Mice

- Part of an evolutionary theory of somatic repair predicts breeding protocols should alter length of non-coding telomere DNA in laboratory rodents relative to wild type. But the theory that predicted it is not acknowledged by the molecular community that confirms it despite potential implications for drug testing.

- What is the optimal hedging instrument?
Example IV: Indexing Tax Brackets and Entitlements in a Dynamic economy

“Traditional neo-classical economics has worked with the assumption that preferences of agents in the economy are fixed. This assumption has always been disputed, and, indeed, in the social sciences outside of neoclassical economics the assumption has never been accepted by anyone. ... preferences of individual agents are the basic measuring rod of economic welfare, of the performance generated in an economic system. How can we evaluate an economic system with a measuring rod that itself changes with the system?” —C.C. von Weizsäcker 2005

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TRY:

- Provocations

EXCEPT:

- Print "REALLY SORRY"
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Global Village Idiot Co-cycle Problem:
Find the Expert
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Example V: The Narrative In Science Manpower Policy

THE PIPELINE FOR SCIENTIFIC AND TECHNICAL PERSONNEL: PAST LESSONS APPLIED TO FUTURE CHANGES OF INTEREST TO POLICY-MAKERS AND HUMAN RESOURCE SPECIALISTS

(NSF: Division of Policy Research and Analysis)

The National Science Foundation (NSF) has collected extensive data covering science and technology activities in the U.S. since the 1960’s. Other agencies and professional associations have also collected data for decades that bear on resources used in science and technology activities (particularly human resources). Recorded changes in the levels of these activities over the last 25 years are a roadmap of changes in national priorities, either federally or collectively expressed.

• Labor Shortages Don’t Exist in Market Economies
  • The wage effects are the point of the programs
• The Science complex is trying to lower wages not forgetting demand and elasticities.
Example VI: The Narrative in Financial Markets: Valuation Problems for Mortgage Backed Securities

Shorting Sub Prime vs. “Would you like to write a book....”

Hedge fund transparency: quantifying valuation bias for illiquid assets

Risk measures, such as the Sharpe ratio, used by investment professionals are only as good as the accuracy of the asset price data used to derive them. Nowhere is this issue more relevant than for hedge funds, which often invest in less liquid assets such as convertible bonds. Here, Eric Weinstein and Adil Abdulali devise a ‘phantom price’ framework for illiquid assets and show how to generalise the Sharpe ratio to incorporate liquidity risk.
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Building a Black Swan Hatchery

Science is a system of selective pressures determining the allocation of scarce resources for the propagation of names, and ideas.

Most precious resource is not funding. It is space in the gated dominant narrative.

Control over high quality discoveries increases the odds of forcing an insertion.

My major focus is increasing the odds that disruptive discoveries enter the narrative with their originators.
Myth of the solitary genius: Most successful mavericks have small organizations.

Because of small N, we probably have to abstract across disciplines.
Schtarker concept is only important if the work is truly disruptive

- “Be sure you always have someone up your sleeve who will save you when you find yourself in deep shit.” -James Watson, Nobel Laureate
Schtarker concept is only important if the work is truly disruptive

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# Model of Successful Mavericks Suggests Organization

<table>
<thead>
<tr>
<th>Maverick</th>
<th>Funder/VC</th>
<th>Protectors</th>
<th>Outreach</th>
<th>Schtarker</th>
<th>Antagonists Neglectors</th>
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<tbody>
<tr>
<td>Feynman</td>
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<td>Bethe</td>
<td>Dyson</td>
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<td>Marcel</td>
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<td>(Father)</td>
<td>Grossman</td>
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<td>Cambridge</td>
<td>Hardy</td>
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Pressure and Flamingo Meritocracy

- Our science job market is much more pressurized than before.
- Shouldn’t that lead to excellence?
Pressure and Flamingo Meritocracy

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• Shouldn’t that lead to excellence?
Pressure and Flamingo Meritocracy

- Our science job market is much more pressurized than before.
- Shouldn’t that lead to excellence?
The 1D Animation

- Caustic
- Alkaline
- Alkalescent
- Neutral

pH Value: 7.0
Survivors: 12/25
Species: 5/5

Threshold of Survival

The Big 2D Animation

X: General Avian Abilities

Pirsa: 08090036
The 1D Animation

Caustic Alkaline Alkalescent Neutral

pH Value = 11.5
Survivors = 4/25
Species = 3/5

Threshold of Survival

The Big 2D Animation

° General Avian Abilities
The 1D Animation

Caustic Alkaline Alkalescent Neutral

pH Value = 9.1
Survivors = 8 / 25
Species = 5 / 5

Canary A
Flamingo A
Stork A
Canary B
Heron A
Duck A
Flamingo B
Heron B
Stork B
Threshold of Survival
Heron C
Canary C
Flamingo C
Heron D
Stork C
Duck C
Flamingo D
Duck B
Canary D
Stork D
Heron E
Duck D
Flamingo E
Heron E
Flamingo E
Duck E

The Big 2D Animation

Pirsa: 08090036
The 1D Animation

Caustic Alkaline Alkalescent Neutral
pH Value: 11.5
Survivors: 4/25
Species: 3/5

Threshold of Survival

The Big 2D Animation

% General Avian Abilities
The 1D Animation

Caustic  Alkaline  Alkalescent  Neutral

pH Value = 7.0
Survivors = 12/25
Species = 5/5

Threshold of Survival

The Big 2D Animation

x: General Avian Abilities

Pirsa: 08090886
The 1D Animation

Caustic  Alkaline  Alkalescent  Neutral

pH Value = 11.4
Survivors = 4/25
Species = 3/5

Threshold of Survival

The Big 2D Animation

κ a General Avian Abilities
The 1D Animation

```
Caustic  Alkaline  Alkalenscent  Neutral
```

- pH Value = 7.01
- Survivors = 12/25
- Species = 5/5

```
Canary A
Flamingo A
Canary B
Heron A
Lark A
Flamingo E
Heron B
Stork B
Stork C
Heron C
Canary D
```

- Threshold of Survival

```
Flamingo C
Heron D
Stork D
Lark C
Flamingo D
```

```
Canary E
Stork E
Heron E
Flamingo E
Duck E
```

Theta Values = 0.05941

The Big 2D Animation
**Animations**

**The 1D Animation**

<table>
<thead>
<tr>
<th>Caustic</th>
<th>Alkaline</th>
<th>Alkalescent</th>
<th>Neutral</th>
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<tbody>
<tr>
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<td>Flamingo A</td>
<td>Stork A</td>
<td>Canary B</td>
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<tr>
<td>Heron A</td>
<td>- Threshold of Survival</td>
<td>Flamingo B</td>
<td>Stork B</td>
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<td>Stork C</td>
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<td>Heron E</td>
<td>Flamingo E</td>
</tr>
<tr>
<td>Duck E</td>
<td>Duck E</td>
<td>Duck E</td>
<td>Duck E</td>
</tr>
</tbody>
</table>

pH Value = 11.18
Survivors = 5/25
Species = 4/5

**The Big 2D Animation**

[Graph showing avian abilities]
The 1D Animation

Caustic  Alkaline  Alkalescent  Neutral

pH Value = 7.0
Survivors = 12/25
Species = 5/5

Threshold of Survival

The Big 2D Animation
The 1D Animation

Caustic  Alkaline  Alkalescent  Neutral

pH Value = 11.5
Survivors = 4/25
Species = 3/5

The Big 2D Animation

x = General Avian Abilities
The 1D Animation

- Caustic
- Alkaline
- Alkalescent
- Neutral

**pH Value:** 7.16

**Survivors:** 12 / 25

**Species:** 5 / 5

- Canary A
- Flamingo A
- Stork A
- Canary B
- Heron A
- Duck A
- Flamingo B
- Heron B
- Stork B
- Stork C
- Heron C
- Canary D - Threshold of Survival
- Flamingo C
- Heron D
- Stork D
- Duck C
- Flamingo D
- Canary E
- STork E
- Heron E
- Flamingo E
- Duck E

The Big 2D Animation

- General Avian Abilities

**Theta Value:** 0.75941
The Big 2D Animation

pH Value = 7.0
Survivors = 12/25
Species = 5/5
Threshold of Survival

Flamingo A
Flamingo B
Flamingo C
Flamingo D
Flamingo E
Stork A
Stork B
Stork C
Stork D
Stork E
Canary A
Canary B
Canary C
Canary D
Duck A
Duck B
Duck C
Duck E
Heron A
Heron B
Heron C
Heron D
Heron E

Pirsa: 08090036
The Big 2D Animation

- Caustic
- Alkaline
- Alkalescent
- Neutral

pH Value: 7.16
Survivors: 11/25
Species: 5/5

Threshold of Survival

Theta Value: 0.85941

Fitness Level Relative to Environment
The Big 2D Animation

Caustic Alkaline Alkalescent Neutral

Flamingo D Flamingo A Flamingo A
Flamingo E Flamingo B Flamingo B
Flamingo C Flamingo D Flamingo C
Stork E Stork D Stork B
Stork E Stork A Stork A
Duck E Duck D Duck A
Duck C Duck A
Duck B Duck C Duck B
Heron E Heron C Heron D
Heron A
Canary E Canary A Canary A
Canary A

pH Value = 11.18
Survivors = 4/25
Species = 1/5

Threshold of Survival

θ = Fitness Level Relative to Environment

θ = General Avian Abilities

θ = Alkalin Tolerance

θ = General Avian Abilities
The Big 2D Animation

Caustic  Alkaline  Alkalescent  Neutral

pH Value = 7.86
Survivors = 10 / 25
Species = 5 / 5

Threshold of Survival

s = Fitness Level Relative to Environment

θ = Fitness Effectiveness

x = General Avian Abilities

y = Alkali Tolerance
The Big 2D Animation

- Caustic
- Alkaline
- Alkalescent
- Neutral

pH Value = 11.47
Survivors = 4/25
Species = 1/5

Threshold of Survival

- Flamingo A
- Flamingo B
- Flamingo C
- Stork A
- Stork B
- Duck A
- Canary A
- Canary B
- Canary C
- Heron A
- Heron B
- Heron C

Theta Value = 0.159407

- X = General Avian Abilities
- Y = Alkali Tolerance
- Z = Fitness Level Relative to Environment
The Big 2D Animation

- Caustic
- Alkaline
- Alkalessent
- Neutral

- pH Value = 10.9
- Survivors = 4/25
- Species = 1/5

- Threshold of Survival
- Theta Value = -0.740592

- s = Fitness Level Relative to Environment
- x = General Avian Abilities

y = Alkaline Tolerance

z = General Avian Abilities
The Big 2D Animation

$\kappa$: General Avian Abilities

Caustic Alkaline Alkaliescent Neutral

$\text{pH Value} = 10.88$

$\text{Survivors} = 4/25$

$\text{Species} = 1/5$

Threshold of Survival

$\theta = 0.759407$

$X$: General Avian Abilities

$Y$: Alkaline Tolerance

$Z$: Fitness Level Relative to Environment
The Big 2D Animation

\[ x = \text{General Avian Abilities} \]

\[ y = \text{Alkaline Tolerance} \]

\[ z = \text{Fitness Level Relative to Environment} \]

- Caustic
- Alkaline
- Alkalescent
- Neutral

\[ \text{pH Value} = 7.4 \]

\[ \text{Survivors} = 10/25 \]

\[ \text{Species} = 5/5 \]

- Flamingo A
- Flamingo B
- Flamingo C
- Flamingo D
- Flamingo E

- Stork A
- Stork B
- Stork C
- Stork D
- Stork E

- Duck A
- Duck B
- Duck C
- Duck D
- Duck E

- Canary A
- Canary B
- Canary C
- Canary D
- Canary E

- Heron A
- Heron B
- Heron C
- Heron D
- Heron E

\[ \text{Threshold of Survival} \]

\[ \text{Theta Value} = 0.45941 \]
The Big 2D Animation

x = General Avian Abilities
y = Alkaline Tolerance
z = Fitness Level Relative to Environment

Caustic Alkaline Alkaliescent Neutral

pH Value = 7.7
Survivors = 10/25
Species = 5/5

Heron A Threshold of Survival

Pirsa: 08090036
The Big 2D Animation

- Caustic
- Alkaline
- Alkaline
- Neutral

pH Value: 10.19
Survivors: 5/25
Species: 2/5

Threshold of Survival

Growth Rate: -1.14059

Fitness Level Relative to Environment
The Big 2D Animation

- Caustic
- Alkaline
- Alkalescent
- Neutral

- Flamingo A
- Flamingo E
- Flamingo D
- Stork B
- Stork A
- Duck B
- Duck C
- Duck A
- Stork C
- Stork E
- Canary A
- Canary B
- Canary C
- Heron C
- Heron E
- Heron D
- Heron A
- Canary E
- Canary D
- Canary B
- Canary A
- Heron D
- Heron E
- Heron A

- pH Value = 11.37
- Survivors = 4/25
- Species = 1/5

Threshold of Survival

- Theta Value = -0.440593

s = Fitness level relative to environment
The Big 2D Animation

$x = \text{General Avian Abilities}$

$y = \text{Alkaline Tolerance}$

$z = \text{Fitness Level Relative to Environment}$

Caustic Alkaline Alkalescent Neutral

$pH \text{ Value} = 11.4$

Survivors = 4/25

Species = 1/5

Threshold of Survival

$\theta = 0.159407$
The Big 2D Animation

Caustic  Alkaline  Alkalescent  Neutral

pH Value = 10.35
Survivors = 5/25
Species = 2/5

Threshold of Survival
Theta Value = 1.05741

s = Fitness level relative to environment
x = General Avian Abilities
y = Alkaline Tolerance
The Big 2D Animation

- Caustic
- Alkaline
- Alkalescent
- Neutral

pH Value: 7.18
Survivors: 11/25
Species: 5/5

Threshold of Survival:
Theta Value: -2.74059
The Big 2D Animation

- Caustic
- Alkaline
- Alkaline
- Neutral

pH Value: 8.23
Survivors: 7/25
Species: 4/5

Threshold of Survival

s = Fitness Level Relative to Environment

π = General Avian Abilities

Y = Alkaline Tolerance

x = General Avian Abilities
The Big 2D Animation

Caustic  Alkaline  Alkalescent  Neutral

pH Value = 9.98
Survivors = 4/25
Species = 2/5

Threshold of Survival
Theta Value = -1.24059

Fitness Level Relative to Environment
The Big 2D Animation

- Caustic
- Alkaline
- Alkalinescent
- Neutral

- pH Value: 10.6
- Survivors: 4/25
- Species: 1/5

- Threshold of Survival
- Theta Value: -0.940923

- Fitness Level Relative to Environment

- x = General Avian Abilities
- y = Alkaline Tolerance
- z = Fitness Level Relative to Environment
The Big 2D Animation

- Caustic
- Alkaline
- Alkalescent
- Neutral

Y = Alkaline Tolerance
X = General Avian Abilities

pH Value = 9.05
Survivors = 6/25
Species = 4/5

Threshold of Survival
Theta Value = 1.65941
Fitness Level Relative to Environment
The Big 2D Animation

\[
\begin{array}{c}
\text{Caustic} & \text{Alkaline} & \text{Alkaléscent} & \text{Neutral} \\
\end{array}
\]

\[
\begin{array}{c}
\text{pH Value} = 9.40 \\
\text{Survivors} = 7/25 \\
\text{Species} = 4/5 \\
\end{array}
\]

\[
\begin{array}{c}
\text{Threshold of Survival} \\
\text{Theta Value} = 1.95^4
\end{array}
\]
The Big 2D Animation

K = General Avian Abilities

Caustic  Alkaline  Alkaloscent  Neutral

pH Value = 7.18
Survivors = 11/25
Species = 5/5

Y = Alkaline Tolerance

S = Fitness Level Relative to Environment

θ = Threshold of Survival

θ = -2.84059

Duck E
Duck D
Canary E
Heron C
Canary D
Heron B
Canary A

Flamingo A
Flamingo B
Flamingo C
Flamingo D
Flamingo E

Stork A
Stork E
Stork D
Stork B
Stork C

Species:
Canary E
Canary D
Canary C
Canary B
Canary A

Heron C
Heron B
Heron A

Duck C
Duck B
Duck A

The Big 2D Animation

x = General Avian Abilities

Caustic  Alkaline  Alkalescent  Neutral

pH Value = 10.8
Survivors = 4/25
Species = 1/5

Threshold of Survival

x = Fitness Level Relative to Environment

y = Alkaline Tolerance

Duck B  Duck C  Duck D  Canary A  Canary B

Duck B  Duck C  Duck D  Canary A  Canary B

Stork C  Stork A  Stork D  Duck A

Stork C  Stork A  Stork D  Duck A

Flamingo E  Flamingo D  Flamingo C  Flamingo B  Flamingo A

Flamingo E  Flamingo D  Flamingo C  Flamingo B  Flamingo A

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

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Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canary D  Heron A  Canary C

Heron C  Canal
One General Good Idea: Synthetic Tenure

- Idea: Grant Synthetic Tenure early (20's) to those few researchers who warrant protection for disruptive research or adaptive valley crossing.
- Guaranteed transition to industry (e.g. finance) and three year employment as a high wage professional in an agreed titled capacity provided the individual makes a good faith effort to take the agreed upon risks and avoiding style drift.