AN ANCIENT CALL TO PEACE
VIA MODERN SCIENCE

Carlos E. Puente
Department of Land, Air and Water Resources
University of California, Davis

The Hemispheric Institute on the Americas
UC Davis, April 22, 2009
Thesis

We humans, with a soul, may learn from recent advancements regarding natural complexity in order to find peace...
Pythagorean theorem

$a, b$ are legs and $c$ is hypotenuse

$a^2 + b^2 = c^2$

$a = b = 1 \Rightarrow c = \sqrt{2} \approx 1.4142 \ldots$
A game for kids

\[ h = (0.7 \cdot 2)^3 \]
A game for kids

\[(p + q)^n\]

game defines a multiplicative \textit{cascade}
After $n = 12$ levels

$h = 56.69 \quad p = 0.7$

intertwined **thorns** via layers having distinct densities

ultimate support on each of the layers is **dust**

**game** generates a **multifractal** measure
Another game for kids

50%  0  1/3  2/3  1  50%

::
Another game for kids

cascade yields equal disjoint thorns over dust
varying the hole size gives topologically the layers on first game

Moral: the two games are intimately related
Accumulated clay

...simply from the dynamics of the games

**notches** above: \( P(1/2) = 0.7, \ P(1/4) = 0.49, \) etc.

**plateaus** below: \( P(1/3) = P(2/3) = 0.5, \) etc.
Accumulated clay

cumulative sets have no derivatives and are locally flat.

they universally have maximal lengths:

\[ d\{(0, 0), (1, 1)\} = 2, \ p \neq 1/2, \ h \neq 0 \]

...also found combining the games and adding randomness.
A veritable deception

a devil’s staircase...
Fully developed turbulence
(Meneveau and Sreenivasan, 1987)

\[ Re = \frac{v \cdot L}{\nu} \gg 1 \]

layers in one-dimensional turbulence as in first cascade
dissipation: atmospheric, boundary layer, wake of a cylinder...

\[ p = 0.7 \quad \text{universal} \]
Our turbulent times

inequities
discrimination
competition
forced equality
disparities
fear

selfish postures and actions

2/3 of the world under poverty
6,000 kids die a day for lack of water
violence and terror...
An optimal system?

$p = 0.7 \quad n = 20$

5, 10, 20 and 40% largest thorns have 57, 70, 84 and 95% of the mass
An optimal system?

\[ p = 0.7 \]
\[ n = 20 \]

5, 10, 20 and 40\% largest thorns have
57, 70, 84 and 95\% of the mass
this is quite close to USA: 59, 71, 84 and 95\%

**Warning:** as both cascades are dissipative,
riding them lead us to “bite the dust”
Common sense code for peace

run cascade in reverse to achieve unity
“cut mountains and fill valleys” to restore equilibrium
live at low Reynolds numbers to avoid violence
Common sense code for peace

run cascade in reverse to achieve unity
“cut mountains and fill valleys” to restore equilibrium
live at low Reynolds numbers to avoid violence:

\[ d = \sqrt{2} \]
\[ Y = X \]

a unique solid solution without thorns and dust
the hypotenuse is the pathway of peace!

Moral: humbly love everyone to find unity, \( 1 = 0.999... \)
A veritable invitation to the origin...
it is pointless to judge when away from the \textbf{improbable} point

...for a \textbf{finite} number of levels, a convex up surface is defined

\textbf{balance} is found aided by gravity...
A reminder of our options

equilibrium \hspace{2cm} \text{turbulence}
calmness \hspace{2cm} \text{violence}
conduction \hspace{2cm} \text{dissipation}
rectitude \hspace{2cm} \text{wickedness}
fifty-fifty \hspace{2cm} \text{thorns}
shortest \hspace{2cm} \text{longest}
reconciliation \hspace{2cm} \text{separation}
integration, / \hspace{2cm} \text{division, $}
wholeness \hspace{2cm} \text{emptiness}
unity \hspace{2cm} \text{dust}
1 = 0.999 \cdots \hspace{2cm} 2/3 = 0.666 \cdots
positive, + \hspace{2cm} \text{negative, -}
future \hspace{2cm} \text{past}
all proceeds to aid needy in Africa and Colombia
**THE HYPOTENUSE**

*By the wisdom of science simply divides the air, to dissipate all its heat coding a subtle cascade.*

*Turbulence is selfish game for it scatters the whole, and its sequence is a frame for the options of the soul.*

Two options before us two pathways ahead, the one is the longest the other straight.

We journey directly or go by the legs, we follow intently or end up in pain.

By walking the flatness or hiking the spikes, we travel in lightness or take serious frights.

The incentive is unity and the call proportion, the key is forgiveness and the goal true notion.

In wandering wickedness there is never a fruit, but in ample humbleness one encounters the root. \( \sqrt{2} \)

There is no excuse, let’s practice fair game: it’s by the hypotenuse or else by the legs.

There is no solution but walking straight: the spikes of disorder insinuate the way. (2)

There is a best pathway: the palpably smooth.

It’s by the hypotenuse and walking in truth.

There is one solution, I tell you the truth. \( Y = X \)

It’s by the hypotenuse and walking in truth.

For any other pathway will lead us astray.
It’s by the hypotenuse, there is no other way.

Oh listen, you brother, let’s brighten the day.

It’s by the hypotenuse, there is no other way.

Otherwise, the devil shall pull by the legs.

It’s by the hypotenuse or else by the legs.

For such road is fractal: as long as it gets.

It’s by the hypotenuse or else by the legs.

Oh let’s mend the broken, growing to the root.

It’s by the hypotenuse, the one that yields fruit.

Let’s keep equilibrium, avoiding dark soot.

\[
\frac{2}{3} = 0.666\ldots
\]

\[
1 = 0.999\ldots
\]

It’s by the hypotenuse, the one that yields fruit.

Oh listen, you brother, a counsel from science.

It’s by the hypotenuse: the simplest design.

I tell you integrating, don’t leave it to chance.

It’s by the hypotenuse: the simplest design.

It’s by the hypotenuse: the simplest design. (2)
For other lessons based on complexity please visit:
http://puente.lawr.ucdavis.edu/peace.htm

For explicit Biblical connections please visit:
http://puente.lawr.ucdavis.edu/chaos_complexity_christianity.htm