

**A N A N C I E N T C A L L T O P E A C E
V I A M O D E R N S C I E N C E**

Carlos E. Puente

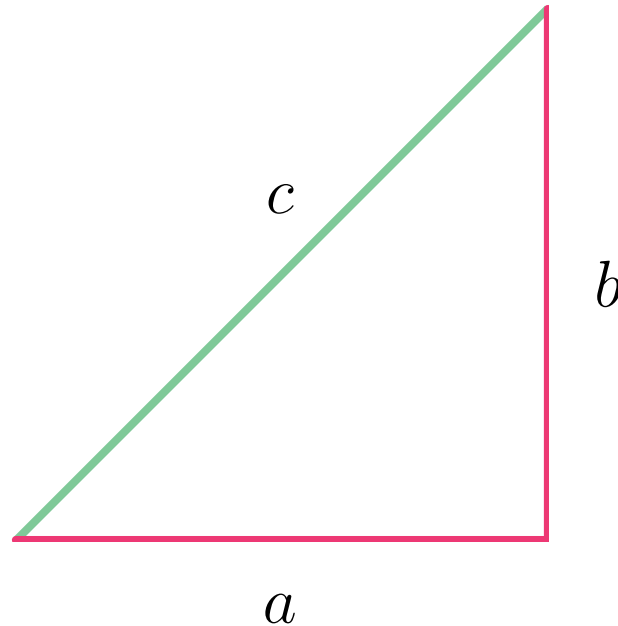
Department of Land, Air and Water Resources
University of California, Davis

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

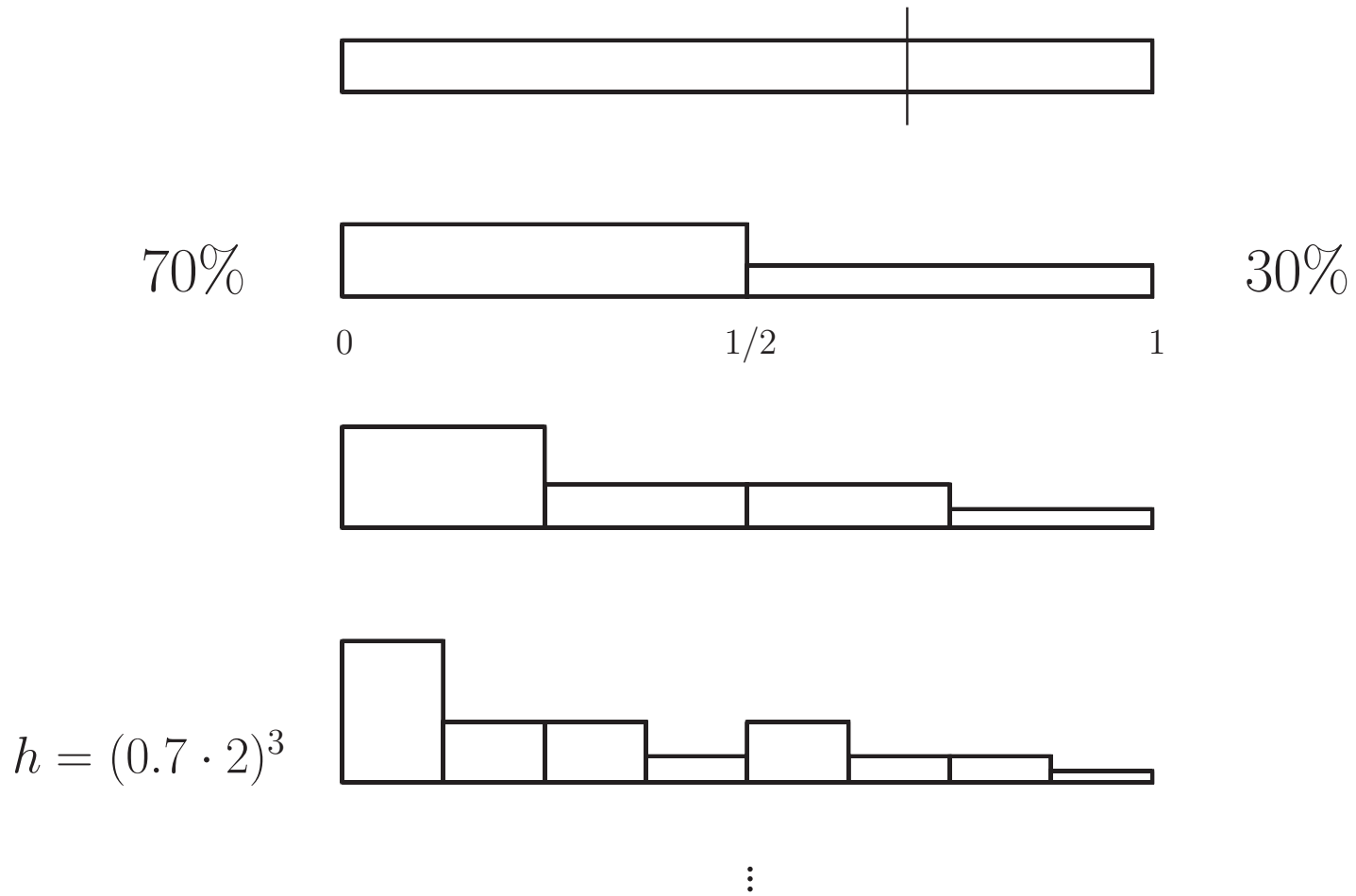


a , b are **legs** and c is **hypotenuse**

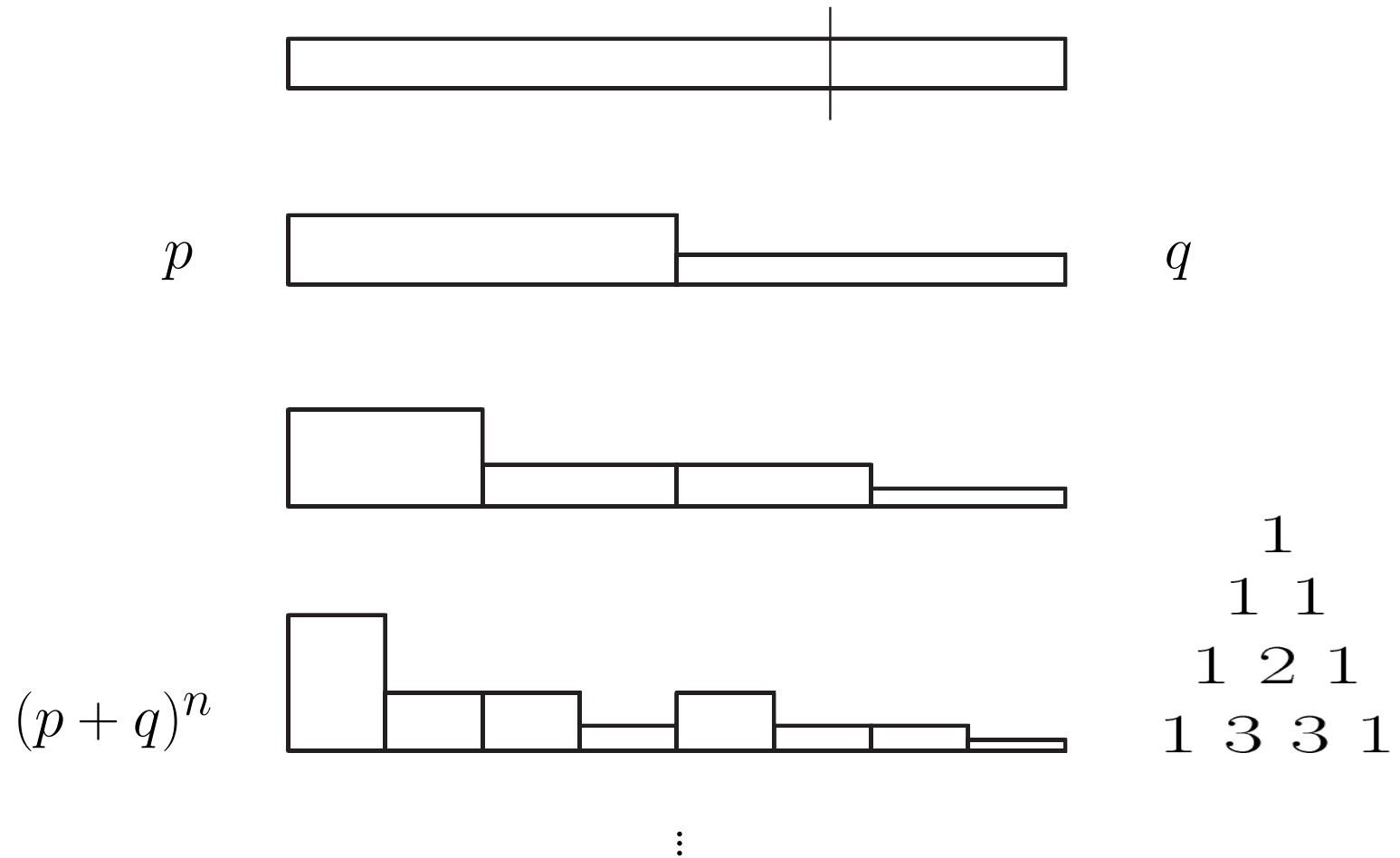
$$a^2 + b^2 = c^2$$

$$a = b = 1 \Rightarrow c = \sqrt{2} \approx 1.4142\dots$$

A game for kids

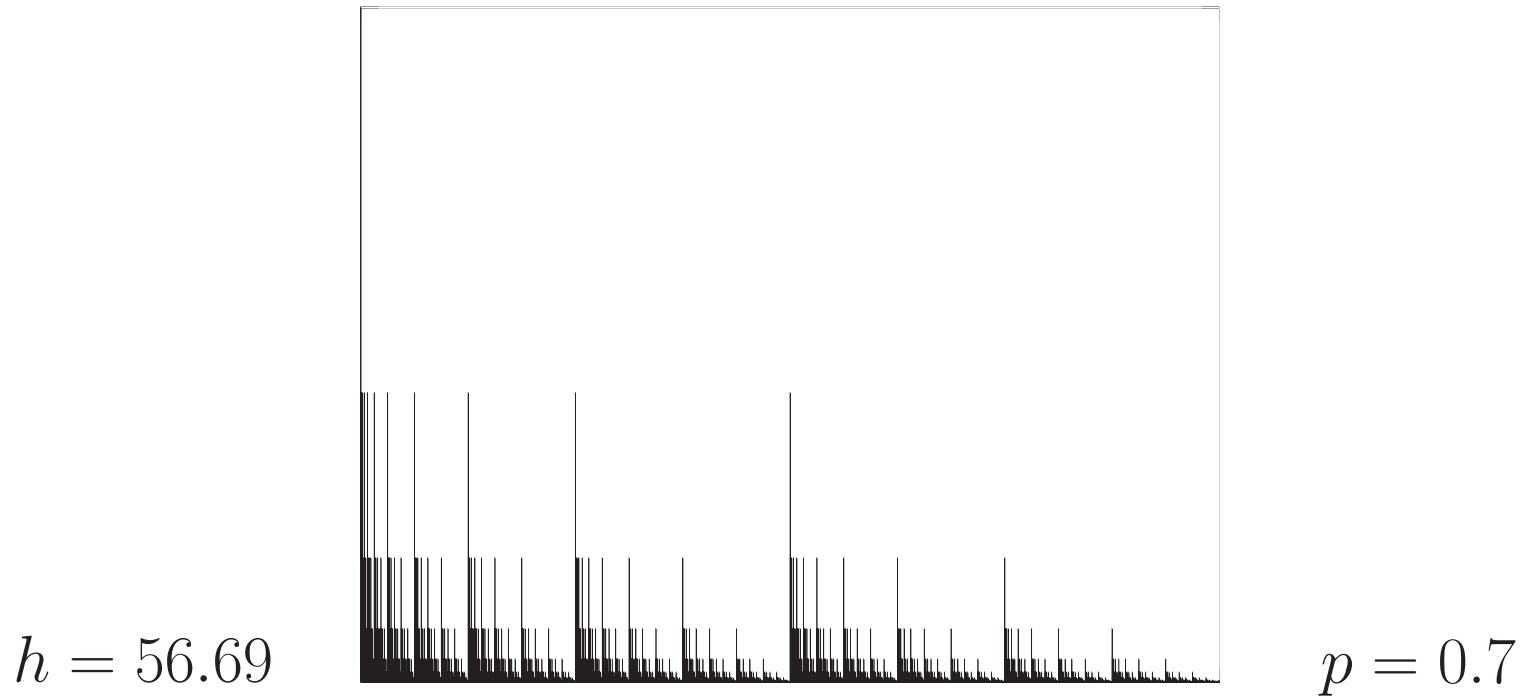


A game for kids



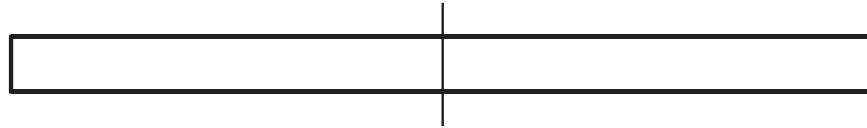
game defines a multiplicative **cascade**

After $n = 12$ levels



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

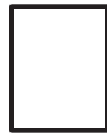


50%



0

1/3



2/3

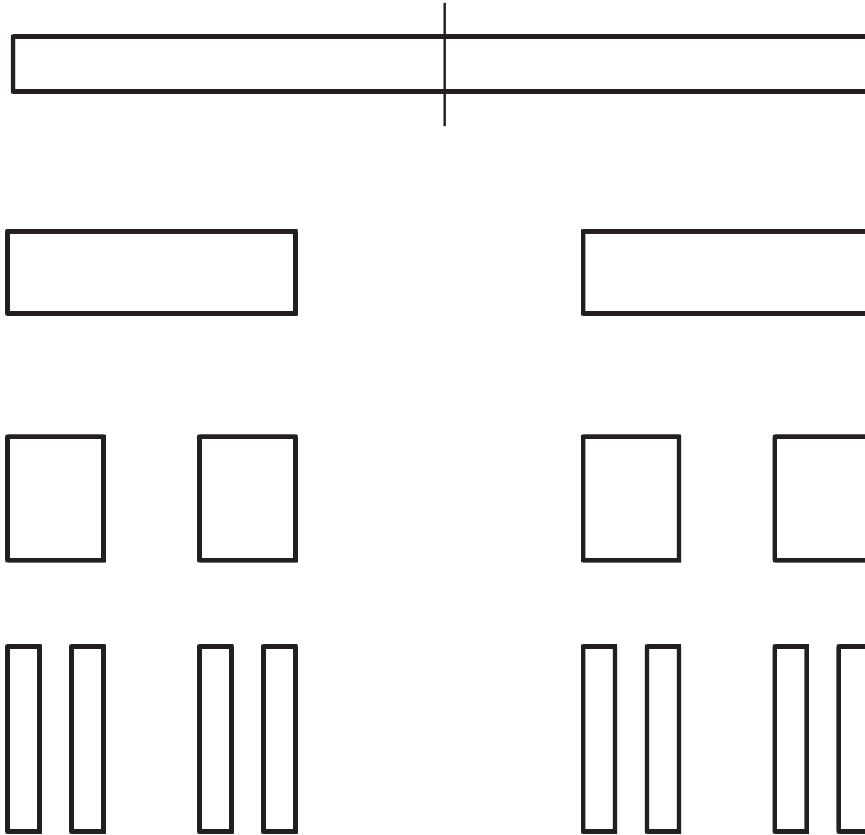
1



50%

⋮

Another game for kids

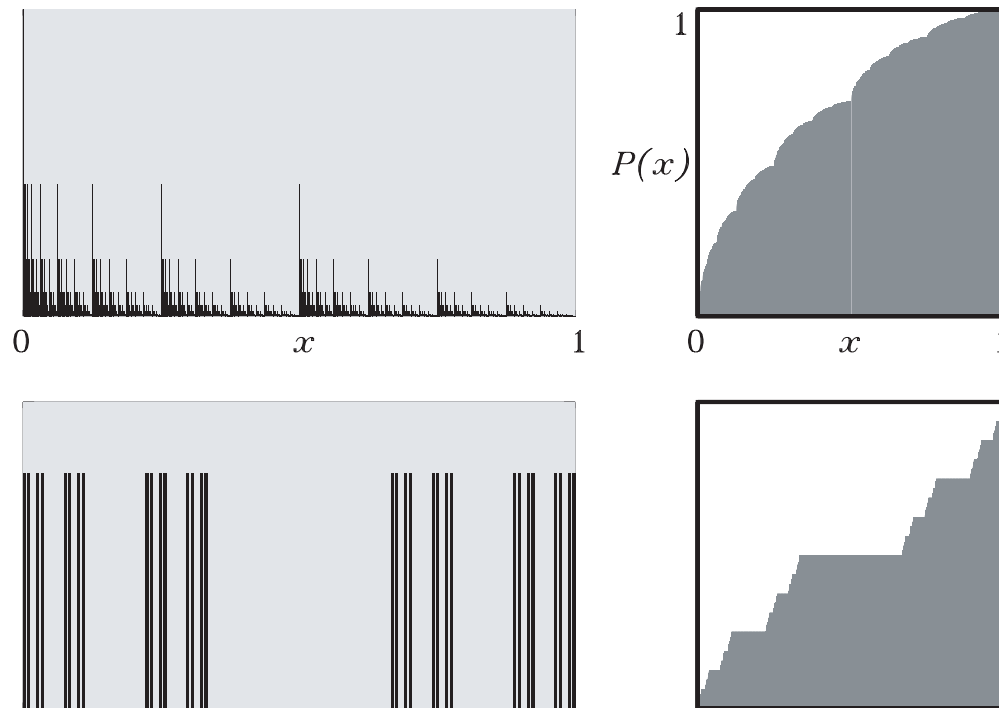


cascade yields equal disjoint **thorns** over **dust**

varying the **hole** size gives topologically the layers on first game

Moral: the two games are intimately **related**

Accumulated clay

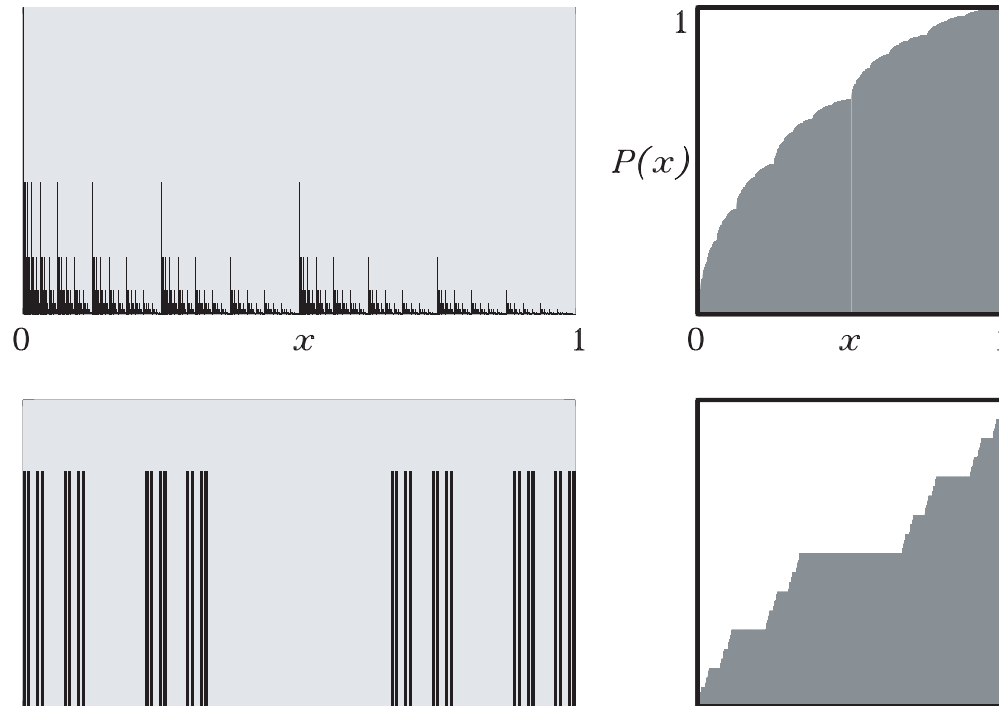


...simply from the dynamics of the games

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

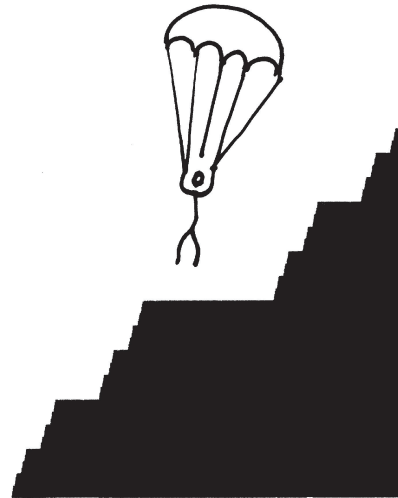


cumulative sets have no **derivatives** and are **locally flat**
they **universally** have **maximal lengths**:

$$d\{(0, 0), (1, 1)\} = 2, \quad p \neq 1/2, \quad h \neq 0$$

...also found combining the games and adding randomness

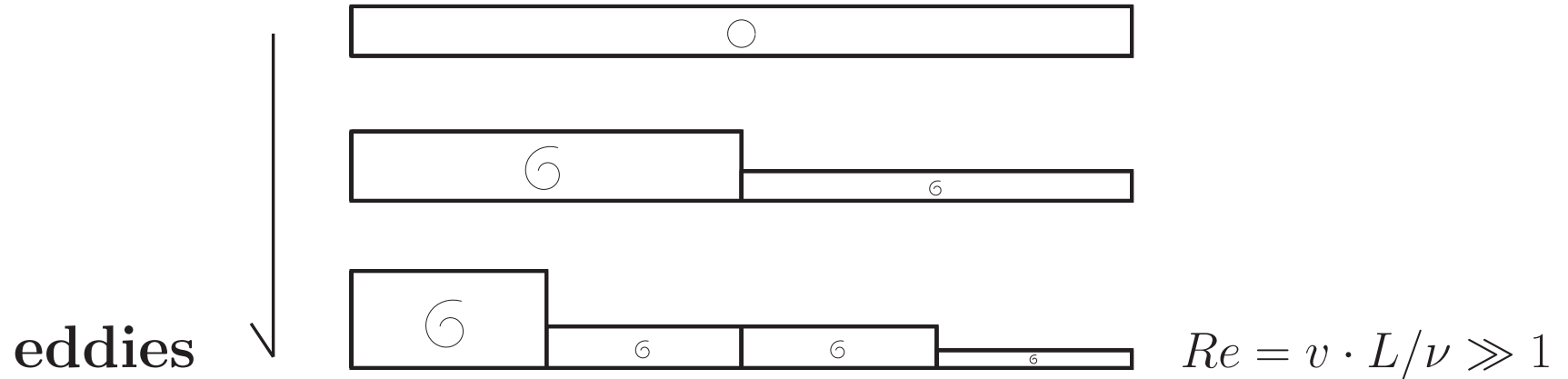
A veritable deception



a devil's staircase...

Fully developed turbulence

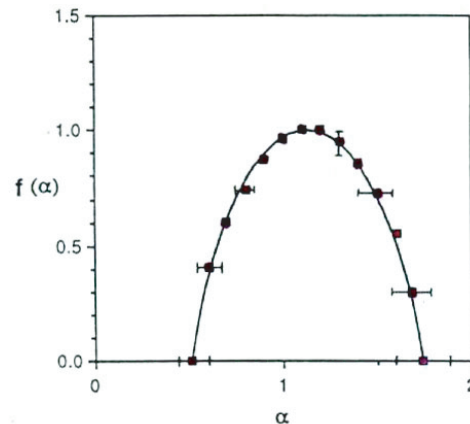
(Meneveau and Sreenivasan, 1987)



layers in one-dimensional turbulence as in first cascade

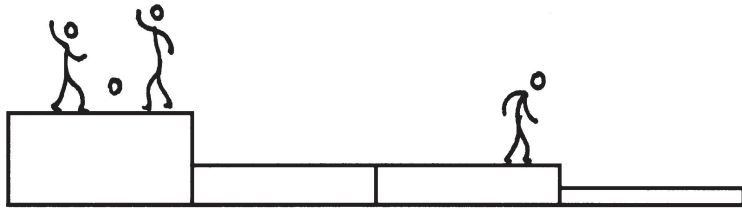
dissipation: atmospheric, boundary layer, wake of a cylinder...

$$p = 0.7$$



universal

Our turbulent times



inequities

competition

disparities



discriminations

forced equality

fear

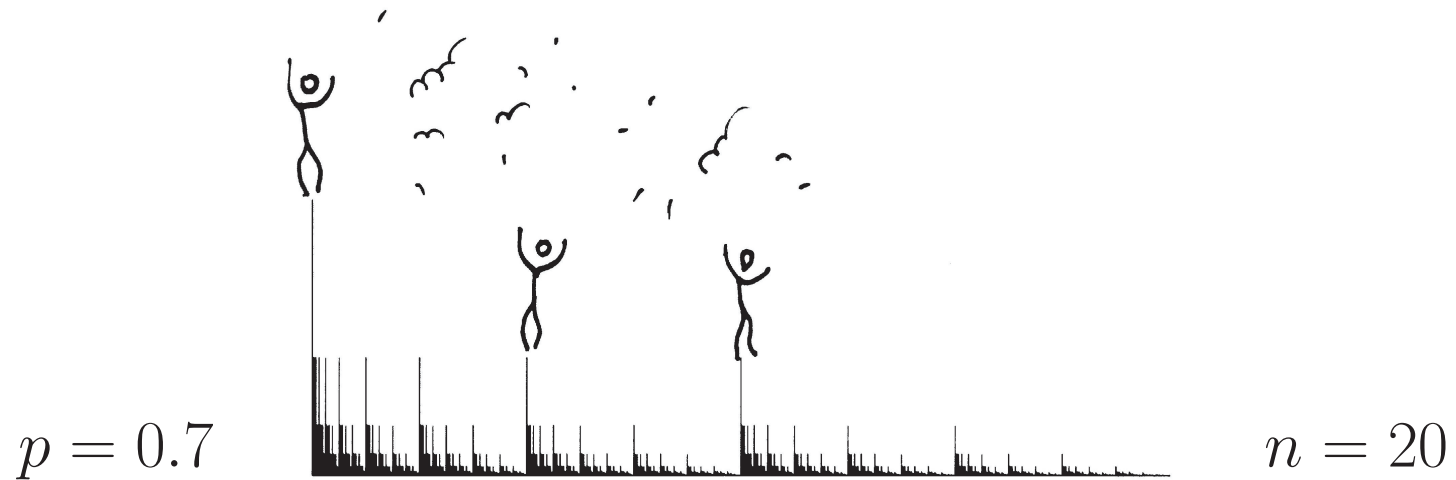
selfish postures and actions

2/3 of the world under **poverty**

6,000 kids **die** a day for lack of **water**

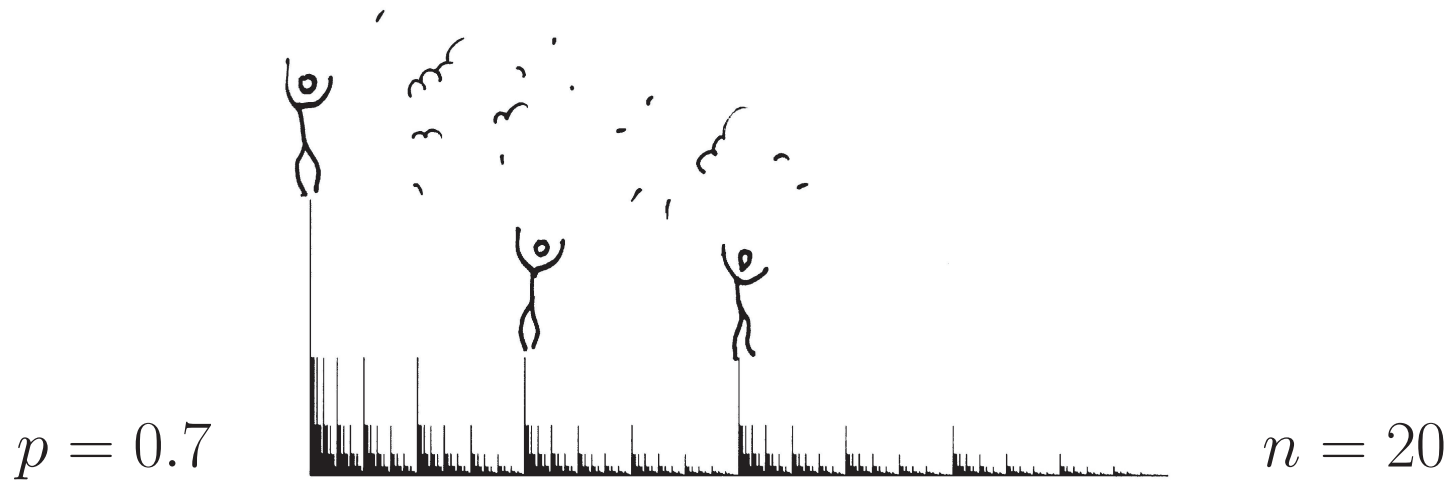
violence and **terror...**

An optimal system?



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

An optimal system?



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**

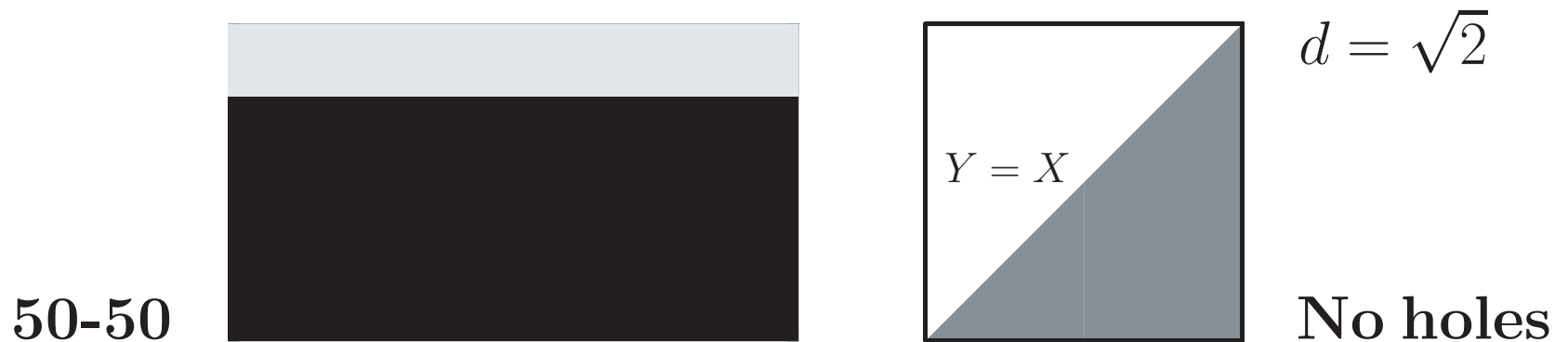
live at **low** Reynolds numbers to avoid violence

Common sense code for peace

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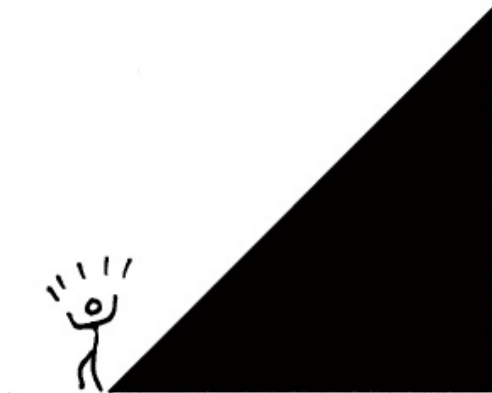
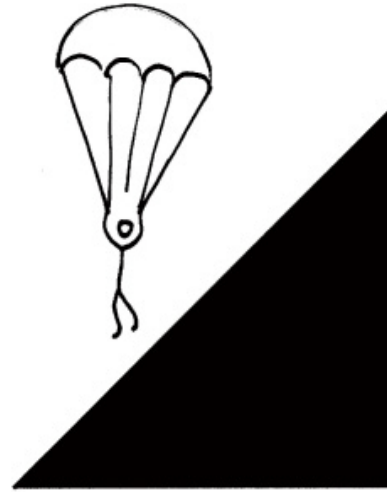


a **unique** solid solution without **thorns** and **dust**

the **hypotenuse** is the pathway of **peace!**

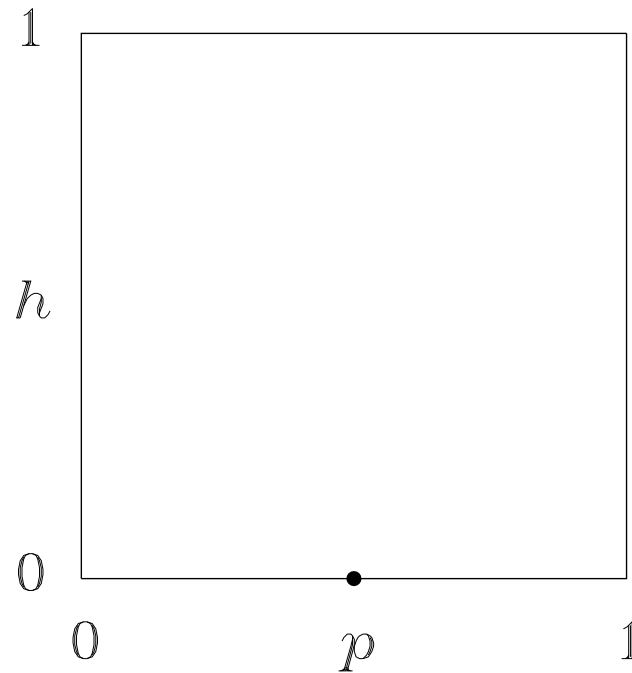
Moral: humbly love everyone to find **unity**, $1 = 0.999\dots$

A veritable invitation



to the **origin...**

More on the key point



it is pointless to judge when away from the **improbable** point
...for a **finite** number of levels, a convex up surface is defined
balance is found aided by gravity...

A reminder of our options

equilibrium

turbulence

calmness

violence

conduction

dissipation

rectitude

wickedness

fifty-fifty

thorns

shortest

longest

reconciliation

separation

integration, \int

division, $\$$

wholeness

emptiness

unity

dust

$1 = 0.999 \dots$

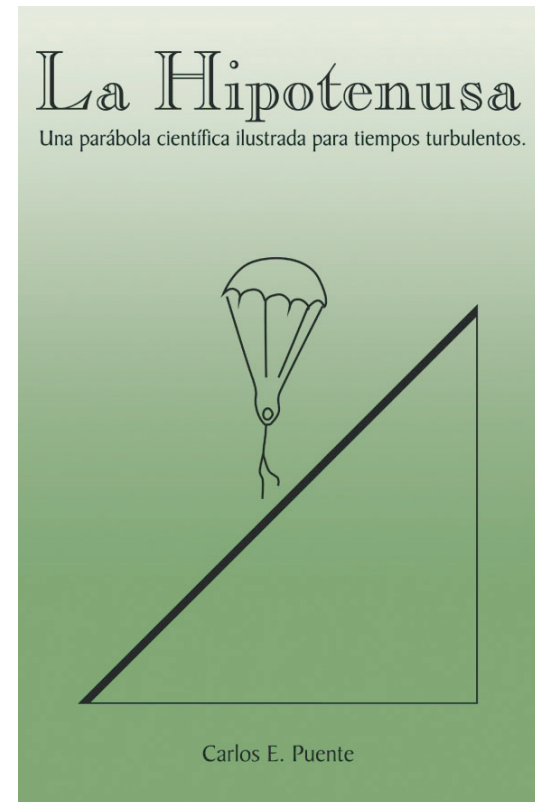
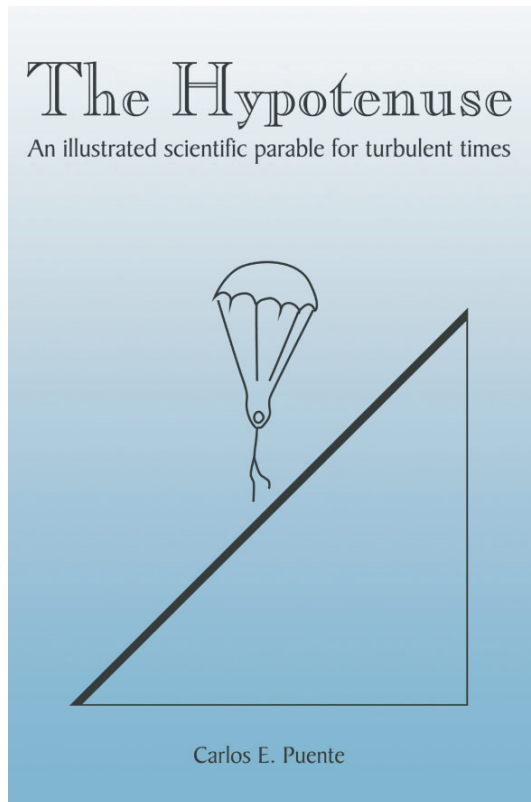
$2/3 = 0.666 \dots$

positive, +

negative, -

future

past



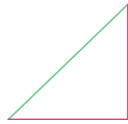
all proceeds to aid needy in Africa and Colombia

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.**

$$2/3 = 0.666\dots$$

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.**

$$1 = 0.999\dots$$

Let's keep equilibrium,
avoiding dark soot.

**It's by the hypotenuse,
the one that yields fruit.**

Oh listen, you brother,
a counsel from science.

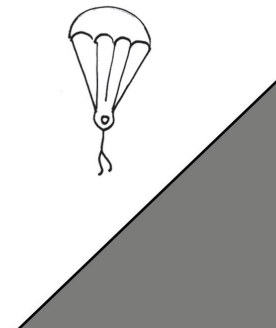
**It's by the hypotenuse:
the simplest design.**

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