Human Ingenuity: Its Care and Feeding, and Why We Need it More Than Ever

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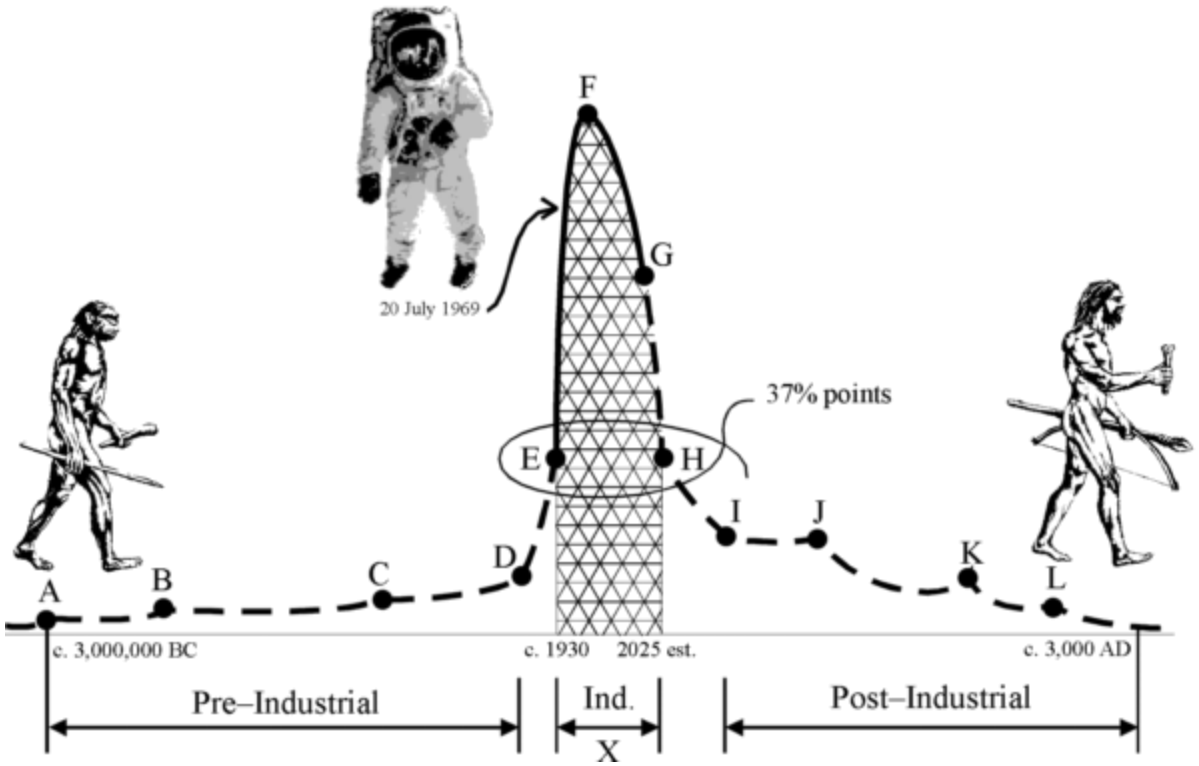
Our Present Predicament

- We are like a deer in the headlights of two semis approaching head-on
  - One semi: fossil fuel depletion
  - The other: climate change
- Will the deer figure it out in time?

The Olduvai Theory (Richard C. Duncan)



Other recent expressions of pessimism…

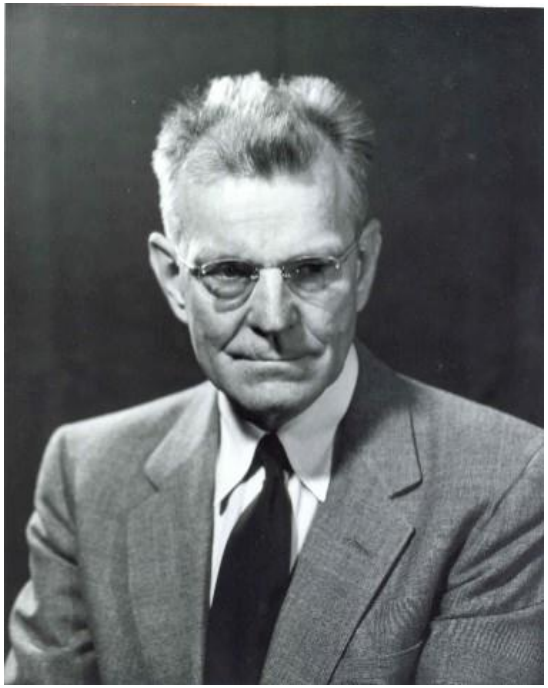
"So much of what we construe to be among our entitlements to perpetual progress may prove to have been a strange, marvelous, and anomalous moment in the planet's history."
--- James Howard Kunstler, *The Long Emergency* (200x)

"It's over, my friend. The game is gone."
--- Kurt Vonnegut (2006)

"We're an encephalized ape that won't last long."
--- Doug Erwin (scientist specializing in extinctions, 2007)

The Hubbert Curve

- The oil peak was predicted by geophysicist M. King Hubbert (1903-1989), who showed that extraction of a finite resource such as oil tends to follow a hump-shaped curve (rough inverse exponential).
- In 1956, he predicted that continental U.S. oil production would peak in 1970; called it to the year.
- “Our ignorance is not so vast as our failure to use what we know.”

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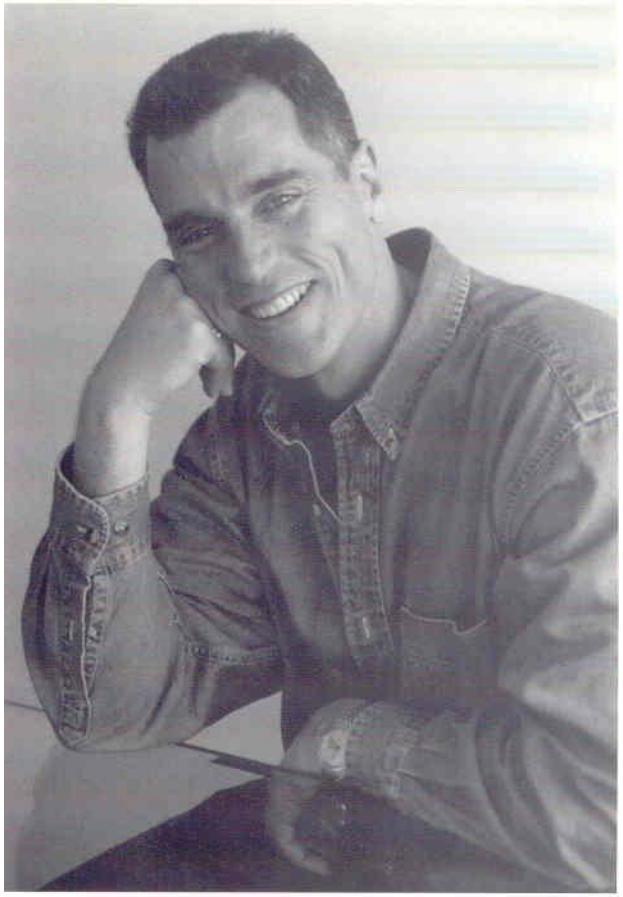
Two Types of Ingenuity

Technological Ingenuity:
the ball-point pen, nuclear reactor, etc., etc.

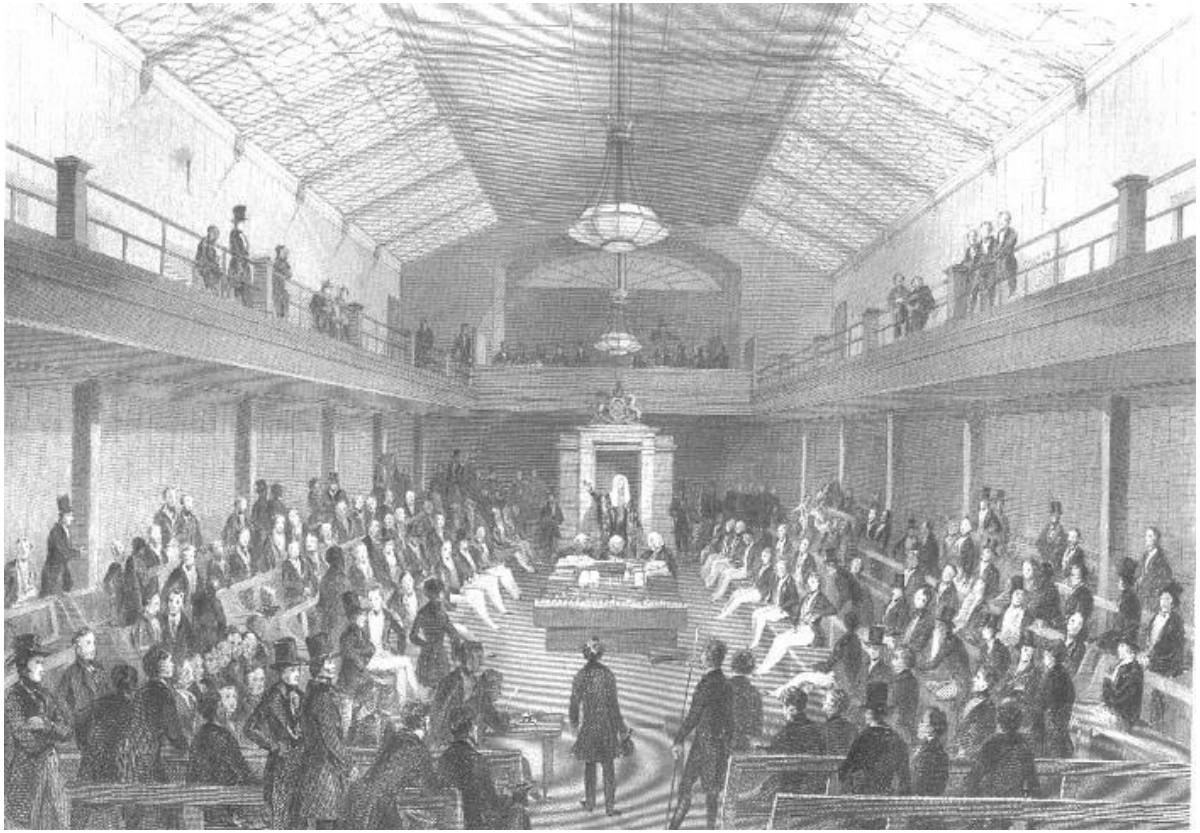
Social Ingenuity:
institutional structures, laws, traditions, habits, rituals, etc.

Thomas Homer-Dixon,
The Ingenuity Gap (2000)



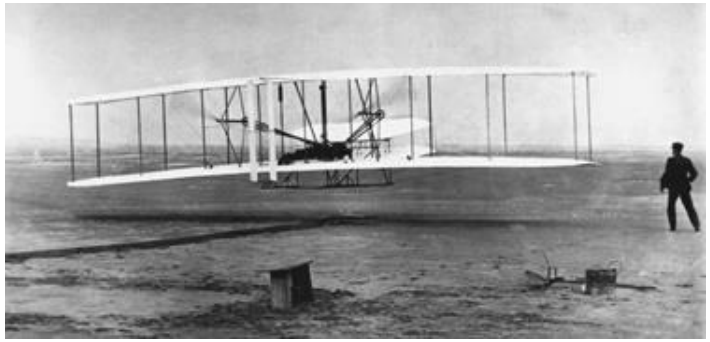
Antikythera Mechanism (ca. 150 BC)

British House of Commons



1903 -- 1958

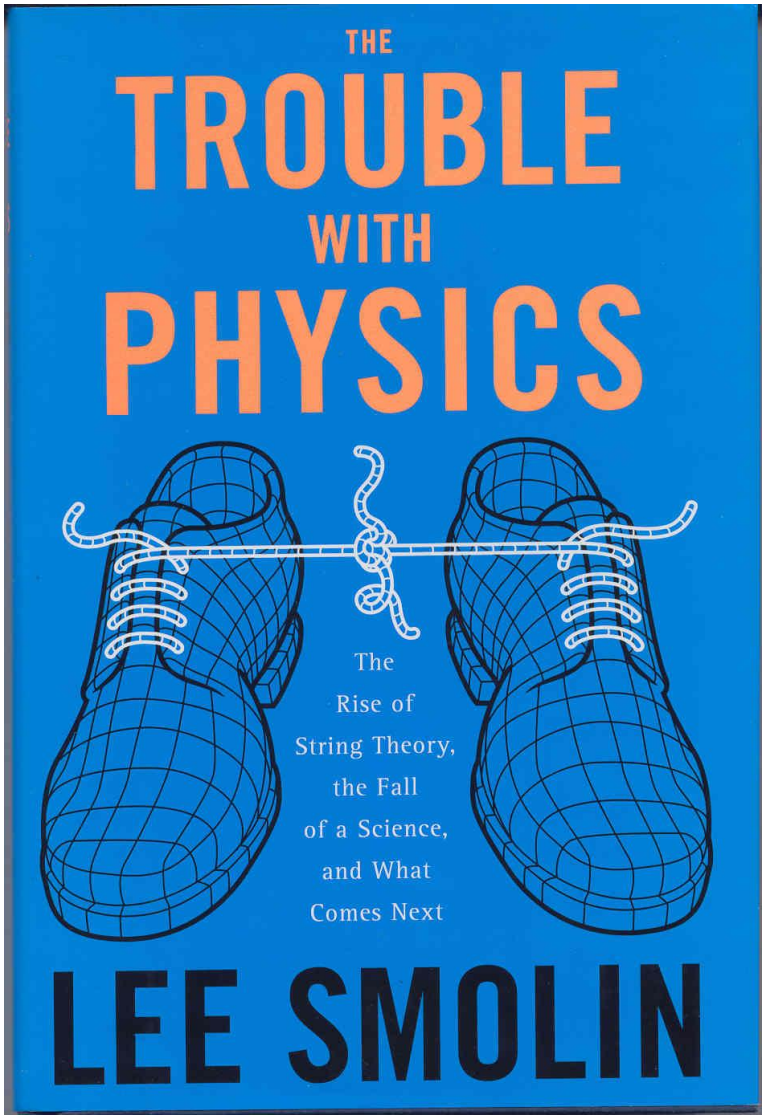
Kitty Hawk…



The late, lamented Arrow

Who is Lee Smolin?

- PhD (Harvard).
- Many publications on GR, cosmology, theoretical biology, quantum gravity, and particle theory (including 18 papers on string theory)
- Currently at Perimeter Institute, Waterloo.
- Books include the following:
  - *The Trouble With Physics*, 2006.
  - *Three Roads to Quantum Gravity*, 2001.
  - *The Life of the Cosmos*, 1997.



- Smolin's question: "Why, despite so much effort by thousands of the most talented and well-trained scientists, has fundamental physics made so little definitive progress in the last twenty-five years?"

John Horgan

The End of Science (1995)

Social/Economic/Political Barriers to Ingenuity

- Ingenuity leads to innovation, which seems dangerous and often can be!
  - Medicine allowed the eradication of smallpox, and its possible re-introduction as a deadly weapon of war.

The Vicious Circle of Scarcity

- Innovation seems especially risky during ecological scarcity (“don’t rock the lifeboat”); thus scarcity can be perpetuated by social pressures against innovation.
- Cultures that survive harsh conditions tend to be socially rigid and do not welcome innovations even if they would lessen the conditions of hardship.

The Fear Factor…

- Many people fear innovation; taboo mentality.
- We fear what we do not understand.
- Innovation threatens ideology.

Eugene Mallove 1947–2004

Founder of New Energy Foundation, which fostered research into cold fusion, zero point energy, and other exotic solutions to the energy problem.

Threat to authority…

- Innovation threatens existing power structures and vested interests.
  - This can descend into sheer criminality.
  - Myth of Prometheus: he was punished by the jealous gods for bringing fire to humanity.
  - Mulder: “Just because you’re paranoid it doesn’t mean they’re not out to get you!”

Organizational inertia…

- Einstein: “Bureaucracy is the death of any achievement.”
- There are few things more Sphexish than corporate or government bureaucracy!

Excessive risk-aversion…

- In medical research…
  - Are the rules to protect patients, or to protect medical establishment from suit?
- In engineering design…
  - Design of light aircraft --- virtually shut down by insurance costs.

Culture of caution in science…

- Science students are taught that it is more important to not make a mistake than to make a discovery.
- Funding supports “safe” projects.
- Powerful egos and reputations protect themselves from criticism and refutation.

Failures of the holy market system…

- New antibiotics, vaccines, are not developed as fast as they are needed.
  - There's no money in it!
  - If you create a vaccine that wipes out a disease, you destroy your market base!

Maybe we just aren't trying hard enough!

"Deep, persistent problems are never solved by accident; they are solved by people who are obsessed with them and set out to solve them directly."

--- Lee Smolin

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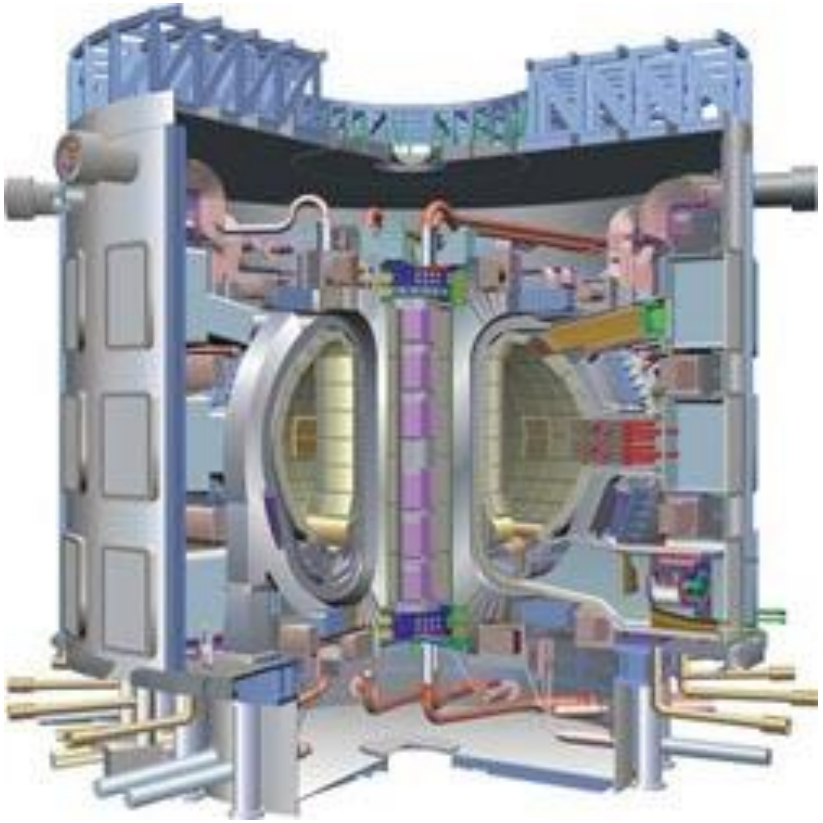

Amartya Sen

Nobel in Economics, 1998

Development as Freedom (1999).